

John Lee Rose

NEW YORK
ZOOLOGICAL SOCIETY

1895



1954

FIFTY-NINTH
ANNUAL REPORT
FOR THE YEAR 1954

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30 East 40th Street, New York 16, N. Y.

THE ZOOLOGICAL PARK
Bronx Park, New York 60, N. Y.



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REPORT OF THE PRESIDENT

Fairfield Osborn

WHILE the activities of the year are fully described in the following sections of this report, special attention is drawn here to a major new development as well as to changing circumstances that will have a direct bearing on finances.

THE NEW AQUARIUM--No news in recent years compares in importance with the fact that the new Aquarium, or at least its first stage, is now actually under construction. This could not have happened except for the loyal and generous financial support of a number of our own Trustees, spearheaded by the contribution of \$250,000 by Mr. Laurance Rockefeller. Additionally, an extremely helpful contribution of \$75,000 was received from the James Foundation, as well as encouraging support from individuals and companies in Brooklyn. The total of contributions in hand at the end of the year amounted to \$544,000, in addition to which the Society contributed \$300,000 from its general funds. We are partners in this enterprise with the City of New York, which will provide the other half of the construction costs that aggregate \$1,480,800. The leadership and aid of Commissioner Moses throughout the entire period of the development of plans has been invaluable. It is gratifying to realize, further, that all of the officials of the City who have had to do with the matter have shown full realization of the significance of the Aquarium as a greatly needed element in the educational and recreational life of New York. If all goes well, the new building will be opened to the public in April, 1956.

FINANCES--Significant changes are taking place in the financial position of the Society. In this regard the year has proved a paradox. Considerable amounts of new money have been received for special purposes such as the new Aquarium, as well as the largest grants from outside sources towards scientific research that have been received during the Society's history. Grants for this latter purpose totalled \$105,000. All of this is most encouraging and yet it must be observed that the present time marks a transition point in our general financial position. For the twelfth year successively it has been possible to report an excess of income over operating expenses. However, this will be the last year in which we are justified in expecting such a satisfactory result unless

substantial amounts of new funds come in through gifts or legacies to strengthen our capital position.

As is the case with every institution, costs have climbed steadily in recent years, in large degree due to the need of increasing salaries. As an illustration, during the year 1948 our employees totalled 248 and received \$762,685 in salaries. During the current year our 250 employees were paid \$961,653 in salaries, representing a payroll increase of 26%. Our salary rates compared with those in other fields of activity are still extremely moderate. Further, together with other quasi-public institutions of the city, we have become a party to the Career and Salary Plan now being adopted by the City government. This plan will prove a long-awaited and well-deserved boon to all of our employees. Nevertheless, its adoption will throw considerable additional burdens upon our available income. Consequently, for the first time in more than a decade, we are entering into a period of deficit operations for which the only appropriate cure is a substantially increased endowment fund. Perhaps it is true that our Society has acquired a reputation of financial well-being somewhat to its detriment. Certainly contributions and legacies, for general purposes, have not been keeping up with the needs in this era of expanding costs. In other words, time has caught up with us and our enviable position of operating "in the black" next year or in succeeding years cannot be maintained without a substantial increase in capital funds.

TRUSTEES--During the year we suffered the loss through death of two Trustees, Mr. Cornelius R. Agnew and Mr. Harrison Williams. Mr. Agnew had served as a Trustee since 1921 and was Treasurer from 1922 to 1953. No individual in the Society's history had given more unstintingly of his time, thought and energy to the interests of our institution. Mr. Williams served as a Trustee since 1923, having frequently given evidence of his belief in the work of the Society, financing the expedition to the Sargasso Sea and the Galapagos Islands in the mid-Twenties and making later and successive contributions to various expeditions of the Department of Tropical Research.

It is a great pleasure to report the election of Mr. Robert E. Blum to the Board.

All in all, the year has been a successful one, carrying the promise of more and better things to come.

THE ZOOLOGICAL PARK

John Tee-Van, Director

THE TWO EVENTS of greatest importance in the activities of the Society during 1954 were the reopening of the Reptile House in the Park and the breaking of ground for the new Aquarium at Coney Island. The re-making of an old building is not a new phase in the Park's development--the Small Mammal House had previously undergone transformation--but it speaks well for the original plan of construction that the older buildings have been serviceable for so long. In our first Guide Book Dr. Hornaday stated that "...the Zoological Society decided that the first large building erected by the Zoological Park should be the Reptile House." The Reptile House was one of the two buildings in operation on the opening day of the Park, November 8, 1899.

That fact alone is enough to indicate the appeal of these animals; we know from actual count that approximately one out of three persons visiting the Park passes through the Reptile House. Given the public's great interest in snakes and alligators, lizards and amphibians, it is fitting that this building should be made into one of our show-places. As now rebuilt, it is just that, and much thought has been given to its educational value, its scientific value and to its ability to adequately exhibit the reptiles of the world. Details of its reorganization will be taken up in the Reptile Department's report.

The ground-breaking for the Aquarium at Coney Island on October 24 was an event long awaited. The 12-acre site is now almost completely cleared, the top soil of the portion of the plot devoted to the building has been removed and the building should be ready for occupancy in the spring of 1956.

Zoological Park attendance during 1954 was 2,380,733, which is 20,273 greater than in 1953 but 3.5% less than the average for the last ten years. It is of interest to observe the small but steady increase in attendance manifested by the Zoo in the last three years--1952, 2,279,080; 1953, 2,360,460; and 1954, 2,380,733. The Zoological Park is thus more than holding its own against the tremendous surge of motor traffic away from the city.

Parking, of course, has materially increased and we now handle more than 300 cars a day the year 'round, 20% more than in 1953. The new field at Bronxdale has functioned well and parking at this site has been increased from an income figure

of \$15,113.65 in 1953 to \$23,550.80 in 1954, an increase of 56%.

The principal arrivals during the year were a pair of young Masai Giraffes, captured late in 1953 in Tanganyika and installed in the Antelope House on October 13. The male is $8\frac{1}{2}$ ft. in height and 20 months old, the female $9\frac{1}{2}$ ft. in height and 24 months old. Two Malay Tapirs, a male about a year old and a slightly older female, were acquired in April. We now exhibit three of the four species of Tapirs--Baird's, Mountain and the Malay--and lack only the common South American species. In April three Jaguar cubs were born to our pair. They were reared on bottles by Mrs. Martini and are in excellent condition. A pair of European Wolverines was purchased in January and is now in the Wolverine enclosure, which previously was the Pandas'. On May 7 "Dacca," our excellent Tiger mother, added her share to spring's reawakening by producing a litter of four male cubs. "Dacca" and her mate, "Rajpur," themselves born in the Zoological Park on February 8, 1944, have produced 25 young since that time. Young tigers are still good publicity and "Dacca's" offspring have inspired much good press coverage.

Births in our Mammal Department continue to be high. In June alone 32 births among 14 different species of animals were recorded, and in July there were 15 fawns of nine species of deer. Gifts from other zoos of course continue, and we received a shipment from Taronga Zoological Park of Sydney, of Dingos and kangaroos, a Tawny Frogmouth, Satin Bower-bird, Giant Laughing Kingfishers and a Wedge-tailed Eagle. A shipment of shore birds also came from the Copenhagen Zoo.

Calls for assistance from various communities--both for the Aquarium and the Zoological Park--continue to come. Other communities building additions to zoos or new zoos or aquariums ask us for assistance in planning and for comments upon their plans. We also have called upon outsiders for help and for the Reptile House alone obtained the advice of the horticulturist at the New York Botanical Garden about our planting, called in a color consultant for assistance with the exhibits and employed an architectural associate to develop the decor of the cages.

The Educational Department continues its good work; 421 lectures were given before 39,356 children in 136 public and private schools and other organizations; 156,185 children from 3,237 classes came to the Park. The In-Service Course for Teachers in the City schools and an orientation course for Girl Scout Leaders were, as in the past, excellent devices for making the Zoological Park and its facilities better known to these groups.

Repeated visits to the Zoological Park of such organizations as the Century Association, the University Club, the Cosmopolitan Club, Coffee House, and the like, are indicative of interest and enjoyment which we have been delighted to fos-

ter. So, too, a luncheon meeting of the Consuls General in New York, sponsored by Ambassador Patterson, provided an excellent opportunity to tell this group about the Park. Much of value has come from this visit. Members of the American Psychological Society spent a day at the Park, holding their meetings in the Administration Building and having lunch at the Zoo bar.

The public's habit of throwing litter about the grounds has been a subject of discussion for many years, even in the very early days of the Park when the administration waged a so-called "litter war." During the past year a renewed attempt was made to curtail litter by posting a series of placards, each with a cartoon animal calling attention to the subject and suggesting "Let's Litter Less." They did undoubtedly lessen the amount of paper scattered by visitors and in 1955 we expect to continue the campaign.

The Council of the Zoological Park--employees meeting with representatives of the staff every two weeks--continues to function well. This year the Council was reorganized and made smaller and its functioning contributes greatly to the smooth operation of the Zoological Park.

SUMMARY OF ATTENDANCE

ZOOLOGICAL PARK

<u>Month</u>	<u>1954</u>	<u>1953</u>
January	40,251	47,457
February	130,516	90,728
March	111,241	135,945
April	249,643	229,645
May	357,291	304,973
June	272,441	230,194
July	320,747	363,498
August	310,401	318,762
September	218,532	240,744
October	216,694	204,091
November	103,142	136,012
December	<u>49,834</u>	<u>58,411</u>
	2,380,733	2,360,460

Total visitors from

November 9, 1899, to

December 31, 1954 119,079,568

DEPARTMENT OF MAMMALS AND BIRDS

Robert M. McClung, Curator, Mammals and Birds
Grace Davall, Assistant Curator, Mammals and Birds
August Schilling, Head Keeper of Mammals
George Scott, Head Keeper of Birds
Lee S. Crandall, General Curator Emeritus

MAMMALS--During 1954 a total of 142 new specimens was added to the collection. Of these, 97 were born here, 23 were purchased, 14 were donated and 8 were received in trade.

Of the 97 births, 76 specimens of 30 different forms were living on December 31, 1954. These were: 1 Euro Kangaroo, 1 Gray Phalanger, 1 Guinea Baboon, 1 Wanderoo Monkey, 1 Hamlyn's X 1'Hoest's hybrid Monkey, 1 Angola Colobus Monkey, 1 Patagonian Cavy, 3 Bengal Tigers, 3 Jaguars, 3 Himalayan Tahrs, 6 Mouflon, 2 Aoudads, 4 Arabian Gazelles, 4 Blue Duiker hybrids, 1 Eland, 4 Nyala, 4 Blackbuck, 2 Reeves's Muntjacs, 2 Axis Deer, 8 Red Deer, 1 Fallow Deer, 3 Barasingha Deer, 1 Indian Sambar Deer, 3 Formosan Deer, 4 Japanese Sika Deer, 2 Dybowsky's Deer, 2 Pere David's Deer, 2 Chinese Water Deer, 2 Northern White-tailed Deer and 2 Rocky Mountain Elk.

Especially gratifying were the birth and successful rearing of three Jaguar cubs, an infant Wanderoo and a hybrid Hamlyn's X 1'Hoest's Monkey, none of which had been reared in the Zoological Park before. Because of the nervousness and unpredictability of their mother, the Jaguar cubs were taken from her when they were seven days old and consigned to the care of Mrs. Helen Martini in the Animal Nursery. Under her expert care they have flourished. The hybrid Hamlyn's X 1'Hoest's Monkey was left with its natural mother and successfully reared, but the little Wanderoo had to be lifted when it was several hours old because its mother would not take care of it. This lively youngster was cared for and reared by Nurse Mary Murphy of the Hospital Staff.

Other interesting "first" births in the collection were a trio of Florida Otters and twin Imperial Marmosets (Mystax imperator). Unfortunately, none of these survived.

It is of interest to note that "Dacca" and "Rajpur," our prolific pair of Bengal Tigers, probably established a record for tigers in captivity when they produced their seventh litter and twenty-fifth cub in May. At the present time no less than twelve zoological parks have received the offspring of this famous pair.

"Cecil" and "Penelope," our capricious Duck-billed Platy-

puses, stirred excitement in staff and press during May and June when their actions seemed to indicate that they might have offspring. They disappointed us again, however, as they had in 1953.

Among the most important of the 23 animals purchased were young pairs of Masai Giraffes and Malay Tapirs, neither of which had been represented in the collection for a number of years.

The Masai Giraffes (Giraffa camelopardalis tippelskirchi) were installed in the Antelope House in October. They clearly show the irregular "leaf-mark" pattern characteristic of this race. They were captured late in 1953 in Tanganyika and were approximately two years old upon their arrival here.

The Malay Tapirs, which had not been represented in our collection since 1936, were purchased in March when they were half-grown youngsters. They have grown rapidly during the year, and are now a very interesting addition to our Elephant House exhibits. We now have three of the four species of Tapirs--Baird's, Mountain and Malay--and lack only the common South American species.

Other interesting and unusual purchases include two Black Lemurs (Lemur macaco), an Acouchy (Myoprocta acouchi), a Paraguayan Agouti (Dasyprocta paraguayensis) and a Callimico or Goeldi's "Marmoset" (Callimico goeldii). The last two species had never before been represented in our collection.

Among the mammals given to the Zoological Park were three forms new to us: two baby Pacific Harbor Seals (Phoca vitulina richardsonii), collected by Dr. Oshin Agathon near Yakutat, Alaska; a young male Gray Seal (Halichoerus grypus), sent to us by Dr. T. W. M. Cameron of McGill University, Montreal; and two Upper Mississippi Valley Raccoons (Procyon lotor hirtus), donated by Dr. E. Raymond Hall of Lawrence, Kansas.

Other appealing gifts included a beautiful Sapphire Mink captured by Mr. Herman Forster; a Northern Hooded Skunk collected by Dr. Charles Bogert; and two European Hedgehogs sent to us from Berlin by two little German girls as "gifts to the children of America."

A pair of Dingos and three Kangaroos were received in exchange from the Taronga Zoological Park, Sydney, and a Long-eared Hedgehog was received from the Biblical Zoo in Jerusalem.

More than the usual number of surplus mammals, most of them hoofed stock, were sold during the year. Fifty-eight animals, all of them born in the Park, were disposed of in this way for a total of \$9,490. Especially gratifying were the surpluses of Pere David's Deer and Arabian Gazelles. Five of the former, now extinct in the wild state, were sold to other zoological parks. Our Arabian Gazelles, the only ones in this country, had increased so satisfactorily that we were able to sell three of these beautiful little animals.

Thirteen mammals were sent in exchange or as gifts to

other institutions. Among these was a Blesbok sent to the Granby Zoo in Quebec as a gift from the New York Zoological Park.

The most important loss during the year was that of an adult male African Black Rhinoceros. "Joe," as his keepers called him, had been suffering from a respiratory disorder for several months. His health deteriorated rapidly despite treatment and on March 15 he was destroyed.

Major structural improvements and changes included the renovation and painting of the Sea Lion Pool; construction of sliding shift doors to connect the large Giraffe stalls in the Antelope House; and the beginning of construction of new installations in the Great Apes House yards to make them more attractive. Designs for the new shading and play apparatus were created by Harmon Goldstone. In the planning stage are the renovation of our Primate House and Bear Dens.

CENSUS OF MAMMALS
December 31, 1954

<u>Orders</u>		<u>Species</u>	<u>Specimens</u>
MONOTREMATA	Platypuses.....	1	2
MARSUPIALIA	Kangaroos, Opossums, etc.....	11	24
INSECTIVORA	Moles, Shrews, Hedgehogs, etc.	2	4
PRIMATES	Apes, Baboons, Monkeys, Lemurs, etc.....	51	93
EDENTATA	Armadillos, Sloths and Anteaters.....	2	2
RODENTIA	Squirrels, Marmots, Beaver, etc.....	11	24
CARNIVORA	Cats, Dogs, Bears, etc.....	37	86
PINNIPEDIA	Sea Lions, Walruses, Seals....	3	5
PROBOSCIDEA	Elephants.....	3	5
PERISSODACTYLA	Rhinoceroses, Horses, Tapirs..	7	11
ARTIODACTYLA	Hippopotamuses, Camels, Deer, Cattle, etc.....	59	300
	<u>TOTALS</u>	187	556

Summary: Orders, 11; Species, 187; Specimens, 556.

BIRDS--A total of 355 new birds was added to the collection during the year, of which 141 were purchased, 190 presented, 33 hatched, 9 received in trade and 7 collected.

All purchases were made in small lots, no large groups of birds coming in at one time, as when we had the services of a professional collector. Those new to our collection include:

Sickle-winged Guan--Chamaepetes goudotii (Lesson)

European Ringed Plover--Charadrius hiaticula hiaticula Linnaeus

Central American Magpie-Jay--Calocitta formosa azurea Nelson

Black-tailed Robin-Chat--Cossypha semirufa semirufa (Ruppell)

Shelley's Glossy Starling--Spreo hildebrandti shelleyi Sharpe

Eastern Violet-backed Sunbird--Anthreptes longuemarei orientalis Hartlaub

Yellow Grosbeak--Pheucticus chrysopheplus chrysopheplus (Vigors)

Rufous-throated Seedeater--Sporophila ruficollis Cabanis

Of the 219 birds received as gifts, 70 were native birds which had been brought to us as fledglings or in an injured condition. The great majority of these were successfully reared or nursed back to health.

A number of specimens were received as gifts from other zoos. A fine group of 14 European shorebirds, including Avocets, Ruffs, Oyster-catchers, a Ringed Plover and a Redshank, were donated by the Copenhagen Zoo in Denmark. Six Redhead Ducks were given to us by the Philadelphia Zoo and four Cape Doves were received as a gift of the Zoological Gardens of Naples.

A pair of Ruby-throated Hummingbirds in our collection was donated to the Copenhagen Zoo, and four native thrushes were sent to the Antwerp Zoo as gifts.

Most notable individual gifts were three Alaskan Bald Eagles collected through the efforts of Dr. Oshin Agathon near Yakutat, Alaska. Two of these were youngsters about two weeks old, still covered with gray woolly down when received here on June 24.

Several excellent Australian birds, including a Wedge-tailed Eagle, two Tawny Frogmouths, three Satin Bowerbirds and two Giant Laughing Kingfishers, were received in an exchange with the Taronga Zoological Park of Sydney.

Birds hatched and reared include 2 hybrid Penguins (Humboldt X Blackfoot); 1 hybrid Tragopan Pheasant (Satyr X Temminck's); 1 hybrid Goose (Richardson's X Lesser Canada X Cackling); 1 Peafowl; 5 Triangular Spotted Pigeons; 3 Barbary Turtle Doves; 1 Eastern Mourning Dove; 10 Gray Zebra Finches; 1 White Zebra Finch; and 4 Cutthroat Finches.

During the summer repairs and renovations were made to the interior of the Aquatic Bird House. It was then repainted, greatly improving its appearance.

CENSUS OF BIRDS
December 31, 1954

<u>Orders</u>		<u>Species</u>	<u>Specimens</u>
STRUTHIONIFORMES	Ostriches.....	1	1
RHEIFORMES	Rheas.....	2	3
CASUARIIFORMES	Cassowaries and Emus.....	2	3

<u>Orders</u>		<u>Species</u>	<u>Specimens</u>
TINAMIFORMES	Tinamous.....	1	1
SPHENISCIFORMES	Penguins.....	7	20
PELECANIFORMES	Pelicans, Cormorants, etc..	8	16
CICONIIFORMES	Hérons, Ibises, Storks, Flamingos, etc.....	27	54
ANSERIFORMES	Swans, Ducks, Geese and Screamers.....	57	375
FALCONIFORMES	Vultures, Hawks and Eagles.	24	31
GALLIFORMES	Quail, Pheasants, etc.....	50	120
GRUIFORMES	Hemipodes, Cranes, Trum- peters, Rails, etc....	20	43
CHARADRIIFORMES	Plovers, Sandpipers, Gulls, etc.....	19	53
COLUMBIFORMES	Pigeons, Doves and Sand- grouse.....	25	81
PSITTACIFORMES	Parrots, etc.....	26	52
CUCULIFORMES	Touracos and Cuckoos.....	5	6
STRIGIFORMES	Owls.....	10	20
CAPRIMULGIFORMES	Frogmouths.....	1	2
APODIFORMES	Hummingbirds.....	5	11
TROGONIFORMES	Trogons and Quetzals.....	2	2
CORACIIFORMES	Kingfishers, Hornbills, etc.....	7	9
PICIFORMES	Barbets, Toucans and Wood- peckers.....	27	36
PASSERIFORMES	Perching Birds.....	<u>238</u>	<u>511</u>
	<u>TOTALS</u>	564	1,450

Summary: Orders, 22; Species, 564; Specimens, 1,450.

DEPARTMENT OF REPTILES

James A. Oliver, Curator

Fred Taggart, Head Keeper (Until November 1, 1954)

Stephen Spencook, Deputy Head Keeper (From March 1, 1954)

THE YEAR 1954 was a busy, trying and rather hectic year in the Reptile Department. It was a year in which important changes took place and, all-in-all, it was a good year for us.

It began with the hurried and numerous activities necessary to complete the interior of the Reptile House and to fill it with an excitingly varied, attractive and educational exhibit of live reptiles. Through the help of a team of outside consultants and the excellent cooperation of the Zoological Park personnel, the work was completed in time to reopen the building on May 26. At that time President Osborn formally dedicated the exhibit that makes up "the most beautiful Reptile House in the world."

Aside from its many attractive exhibitional and educational features, the "new" building provides us with the most modern facilities for the housing of a large and varied collection of reptiles. Insofar as possible it is designed to meet the needs of virtually any reptile from any part of the world. In this building we now hope that we can breed and rear many species of reptiles, as well as exhibit species rarely seen in other zoos.

One feature of the Reptile House that was stressed at all times in the design of the interior was the educational aspect of the exhibits. Every opportunity was taken to provide as much information as possible--and to present it in an appealing fashion. Many exhibits were grouped around a central theme or topic to illustrate interesting features of the biology of reptiles; for example, feeding habits, growth and reproduction of representative groups. Live species are combined with the display of skulls to show tooth structure, and with graphs and charts to illustrate composition of food and rate of growth. Other large label displays give material on venomous reptiles, care of pet turtles and the relationships of amphibians and reptiles. Because of our constant awareness of the need for maintaining accurate and attractive educational exhibits, we expect the Reptile House to remain one of the outstanding Zoological Park exhibits.

Important changes in keeper personnel took place during the year. Head Keeper Fred Taggart, who had served the Society long and faithfully, for more than forty years, retired

on November 1, 1954. Fred first came to work in the Zoo in 1911 and became a reptile keeper in 1916. He will be missed greatly by his many friends. Fortunately for the care of the collection, Keeper Stephen Spencook is well qualified to step into Taggart's position and has been in charge of the Reptile House operations during the year.

At the Members' Meetings in January the second of the planned series of educational films on reptiles was shown. Entitled "Introducing the Reptiles," it is designed as an introduction to the series. Because of its broader scope it is longer than any of the others, running for 17 instead of the normal one reel length of 10 minutes. It compares the five groups of reptiles with one another and relates reptiles to the other living vertebrates, as well as showing something of the general habits and distribution of reptiles. The picture was received enthusiastically and is now being distributed by the McGraw-Hill Text-Film Department. Work was started on the next film of the sequence, "Defensive Devices of Reptiles," which will depict in color some of the fascinating behavioral and structural features of protection found in reptiles. Most of the footage required in this film was taken in 1954.

REPTILES AND AMPHIBIANS--Before the reopening of the Reptile House there was a concerted effort to build up the collection, in both species and specimens. Several rare or unusual specimens were acquired and we ended the year with the greatest number of species in the collection since 1913, a total of 170. During the year 507 specimens were received, as gifts (222), exchanges (73) and purchases (212). At the same time we sent out 156 specimens on exchange, 13 specimens by sale and 3 as gifts. Gifts and exchanges involved 22 institutions as follows: The American Museum of Natural History and the Staten Island Zoological Park, New York City; Trailside Museum, Bear Mountain, New York; Zoological Society of San Diego; Lincoln Park Zoo, Chicago; Black Hills Reptile Garden, South Dakota; National Zoological Park, Washington, D. C.; St. Louis Zoological Gardens; Columbus Zoological Park; Museum of Zoology, University of Michigan, Ann Arbor; The Honolulu Zoological Park; Antwerp Zoological Gardens; London Zoological Park; Cologne Zoological Gardens; Dr. Popp, Dessau, Germany; Colombo Zoological Gardens, Ceylon; Tel-Aviv Zoological Gardens, Israel; Biblical Zoo, Jerusalem; Paignton Zoo Aquarium and Reptile House, England; Colonel Wilkins, London; Edinburgh Zoo; Professor Pierre Beck, Cap Ferrat Vivarium, France.

Two snakes received during the year were new to our collection. These were the Twin-barred Tree Snake (Chrysopelea pelias) from eastern India and the South African Horned Viper (Bitis caudalis). Both are of considerable interest because they are highly specialized for a particular way of life. The Tree Snake, as its name suggests, is an agile arboreal form that amazed us with its climbing and springing abilities.

These snakes are so expert in the latter activity that they were formerly called "Flying Snakes." The rare Horned Viper comes from a desert region in southwestern Africa and, like our "horned" Sidewinder Rattlesnake of the arid southwestern United States, moves across the loose sand by "sidewinding" locomotion.

Other unusual or particularly interesting specimens received during this year were a Central American Palm Viper (Bothrops lateralis) found in bananas in Connecticut, a Prairie Rattlesnake used by the Hopi Indians in their annual snake dance and a female Indian Rock Python with a clutch of 34 eggs. The rattlesnake and python were of such interest that they were reported in articles in Animal Kingdom.

The gathering of a large collection of reptiles in such a short time as was required for the reopening of the Reptile House, involves numerous problems and hazards. The routine of adjustment to conditions of captivity may be simple in the case of many species, but also can be quite challenging in other forms, for one of the biggest hazards at such a time is the introduction of parasites or contagious diseases. Many zoological parks have had their reptile collections hit hard by an epidemic of a parasitic protozoan, Endamoeba invadens, similar to the form causing amoebic dysentery in human beings. Shortly after the reopening of the Reptile House our collection was reduced drastically by an outbreak of this type. Before it subsided we had lost a number of very valuable specimens, including many old timers that had been in the collection for years.

CENSUS OF REPTILES AND AMPHIBIANS December 31, 1954

<u>Orders</u>	<u>Species</u>	<u>Specimens</u>
<u>AMPHIBIA</u>		
CAUDATA		
Salamanders.....	10	19
SALIENTIA		
Frogs and Toads.....	13	26
<u>REPTILIA</u>		
CROCODYLIA		
Alligators and Crocodiles.....	8	38
SQUAMATA		
Lizards.....	14	27
Snakes.....	73	106
TESTUDINATA		
Turtles and Tortoises.....	<u>52</u>	<u>125</u>
<u>TOTALS</u>	170	341

Summary: Orders, 5; Species, 170; Specimens, 341.

Research activities within the department were conducted on a limited basis because of the concentration of attention on the operations of the building program. It is expected that the facilities of the new building will permit an increase in research work. Some investigations were continued from past years and a few new ones were begun, both within the department and in cooperation with others.

During the past year Dr. Oliver talked to the following groups:

Annual winter meeting of the Ninth District of Federated Women's Garden Clubs of America
 Esso Research Club of Elizabeth, New Jersey
 American Society of Mechanical Engineers, Schenectady Chapter of General Electric
 Summit Nature Club, Chatham, New Jersey
 Methodist Men's Club of Tenafly, New Jersey
 Zoological Park, In-Service Teachers' Course

In November the curator helped a group of young herpetologists form a Reptile Club to meet once a month in the Reptile House under his guidance and supervision. Approximately twenty enthusiastic young men attended this organizational meeting. In September Dr. Oliver travelled to Gainesville, Florida, to attend the annual meeting of the American Society of Ichthyologists and Herpetologists, held jointly with the American Institute of Biological Sciences.

During the year Dr. Oliver wrote three articles for Animal Kingdom:

"The Most Beautiful Reptile House in the World"
 Vol. 57, No. 4, pp. 98-109
 "Save Our Snake"
 Vol. 57, No. 5, pp. 144-5
 "This Hopi Messenger Went Astray"
 Vol. 57, No. 6, pp. 170-78

COMBINED CENSUS
 December 31, 1954

	<u>Species</u>	<u>Specimens</u>
MAMMALS	187	556
BIRDS	564	1,450
REPTILES AND AMPHIBIANS	<u>170</u>	<u>341</u>
TOTALS	921	2,347

ANIMAL HOSPITAL

Leonard J. Goss, Assistant Director-Veterinarian
Charles P. Gandal, Assistant Veterinarian

YOUNG ANIMALS, interesting as they are for exhibition purposes, create special problems for the Veterinary Department. So much is known about nutrition--and yet, in some respects, so little--that the problems are perpetually challenging, for long experience has taught every person charged with the care of wild animals that diet is of the utmost importance if the animals are to mature as fine, healthy specimens.

These remarks are stimulated by the pediatric care given this past year to litters of three Jaguars and three Tigers, to the pairs of young Nile Hippopotamuses and Pigmy Hippopotamuses acquired in 1953, and the pairs of Malay Tapirs and Masai Giraffes that came to us in 1954. The pairs are potential breeding stock and all, including the giraffes and the carnivores, may be expected to have extended life-spans. If they are going to survive for many years, it is all the more important to see that they get a good start in their Zoo life.

An important nutritional consideration in rapidly growing animals that are necessarily kept indoors during the colder months is a suitable substitute for the anti-rachitic vitamin D of sunshine. Codliver oil is used for the carnivores; irradiated yeast for other species. Steamed bone meal provides minerals. Gains in weight and apparent sound physical condition attest the value of attention to the diet of the young.

An interesting and not entirely understood situation involved one of the three Tiger cubs. It refused meat at the usual weaning age of six to eight weeks, continuing on a diet of evaporated milk and water until it was seven months old, despite repeated efforts to change it to more suitable food. At seven months the cub was induced to take rabbit meat, and then it graduated through goat meat to our routine horse meat. As a small cub it developed cataracts on both eyes and these were diagnosed as irreversible by a consulting ophthalmologist of wide practice among human beings. To his and our surprise the cataracts began to disappear and at the age of about 10 months the animal's sight returned to normal.

The cat animals are routinely given prophylactic vaccination against panleukopenia at the age of three to four months, a practice consistently followed for a good many years past so that outbreaks of this disease have been controlled in our collection.

A male Wanderoo Monkey, wholly neglected by its mother from the day of birth, was successfully bottle-reared by Nurse Mary Murphy, and an orphaned Sea Lion pup was taught to eat fish under the supervision of Hospital Attendant Coder. Subsequently it was returned to the Sea Lion Pool.

Work on the development of an injectable agent for producing general anesthesia in birds was completed and will be published in the coming year. It is adaptable to all species and sizes of birds and was successfully used by Dr. Gandalin removing a cataract from the eye of a Wood Rail and has been found helpful in removing eggs from egg-bound birds.

Work is continuing to find an anesthetic suitable for use with reptiles. Trials were made on several mammalian and reptilian subjects of the currently popular "antihypertensive" drugs to determine their tranquilizing effects on excitable or intractable animals. The preliminary tests are encouraging.

For the third year Dr. Gandali and Dr. Theodore Kazimiroff, the latter our consulting dentist, continued their observations and recording of the dentition of the young Hippopotamuses. At the approximate ages of three and four years they have not yet grown their adult teeth.

The major loss of the year was that of a male African Rhinoceros which was destroyed after a prolonged course of pulmonary symptoms. The animal's size and temperament made it impossible to conduct a satisfactory examination or tests to establish a diagnosis. Autopsy revealed a granulomatous or productive tuberculosis infection of the bovine type, with lesions confined to the pulmonary cavity and involving approximately 90% of the lung tissue. Presumably infection resulted from exposure to human beings infected with bovine tuberculosis, since the animal had no cage mate and there were no other cases of the disease in the Elephant House.

HOUSEKEEPING--A new refrigerator compressor was installed in the Animal Hospital, and the refrigeration equipment in the Animal Cookroom was modernized.

PERSONNEL--Dr. Goss was appointed to the Advisory Board of the Berg Institute of Scientific Services of New York University-Bellevue Medical Center. He was elected Vice-chairman of the American Association of Zoological Parks and Aquariums.

Numerous personnel changes occurred in services under the supervision of the Veterinary Department. James Coder, Hospital Attendant since 1946, succeeded Nelson Miller as Superintendent of the Farm-in-the-Zoo. William Colloton replaced Ernest Smith, Sr., upon the latter's retirement as Cook and Butcher. Mrs. Eleanor Good, Hospital secretary, was succeeded by Miss Rose Marie Tarantola, and Gustave Waltz, formerly a keeper in the Mammal Department, filled the Hospital Attendant vacancy.

VISITORS AND CONSULTATIONS--Dr. Weaver Williamson, Veterinarian of the Chicago Zoological Park, and Dr. Anthony Sylstra, Veterinarian of the San Diego Zoo, spent several days with us observing methods and procedures.

Twenty-five postgraduate dental students from the New York University College of Dentistry made a tour of the Hospital and were given a talk on dental and research problems.

Advice on the maintenance of experimental primate colonies was given to the College of Physicians and Surgeons of Columbia University, Mount Sinai Hospital, the Creedmore Institute of Creedmore State Hospital, the Berg Institute of Scientific Services of New York University-Bellevue Medical Center and the Cornell Medical School.

PUBLICATIONS, LECTURES, MEETINGS--Dr. Goss prepared the chapter on wild animals in "Veterinary Necropsy Procedures," a book sponsored by the Armed Forces Institute of Pathology and the American Veterinary Medical Association. He addressed the Army Medical Service graduate school on "Diseases of Zoo Animals" and led a general discussion of Zoo veterinary practices at the Veterinary College of Cornell University. He also spoke on veterinary practices before the Farmers' Credit Association at Hudson, N. Y.

Dr. Gandall led a general discussion of Zoo veterinary practices before the Litchfield County Veterinary Medical Association and spoke on "Age Determination in Mammals" at a symposium on age determination of the New York Academy of Sciences. Proceedings of the symposium were subsequently published.

Dr. Goss attended meetings of the American Animal Hospital Association in New York as well as the annual meeting of the American Association of Zoological Parks and Aquariums at Baltimore. Dr. Gandall attended the Annual Conference for Veterinarians at Cornell University.

COOPERATIVE RESEARCH--The following projects were aided:

Princeton University--Comparative studies of the blood cells of man and the camel.

New York State Psychiatric Institute and College of Physicians and Surgeons--Comparative electrophoretic study of the hemoglobins.

Rutgers University, Serological Museum--Comparative serology.

New York University-Bellevue Medical Center, Department of Pediatrics--Comparative endocrinology.

Columbia-Presbyterian Medical Center, Department of Anesthesiology--Comparative studies of the laryngeal mechanisms.

New York State Police Laboratory--Crime detection, by furnishing hair samples.

Forty animal specimens, after death, were sent to research institutions with which we are cooperating. Thirteen mammals, 11 birds and one reptile were sent to the American Museum of Natural History for study or exhibition.

PUBLIC RELATIONS--The In-Service Course for teachers in New York City schools, which normally includes a visit to the Animal Hospital and lecture by a member of the Veterinary staff, was extended to include the Farm-in-the-Zoo at the request of the teachers.

Drs. Gandal and Kazimiroff took part in a national NBC television program in connection with Children's National Dental Health Week, appearing in a film illustrating our procedures in examination and care of the teeth of wild animals.

The attention given the teeth of animals in the Zoological Park was also the subject of a feature article in the Metro Group of Sunday newspaper supplements.

STATISTICS--The Zoological Park's First Aid service, which operates under the direction of the Hospital staff, handled 2,673 cases. Zoo employees furnished 30 pints of blood to the Red Cross Blood Bank, 21 of which were used in transfusions for seven employees or members of their families.

Birds hospitalized during the year numbered 110 for 4,648 days. One hundred and fifty-four mammals were hospitalized for 3,009 days. Outpatient treatments numbered 345 mammals, 120 birds and 45 reptiles.

The mortality tables following require some explanation. "Total in Collection" is arrived at by adding to the census at the beginning of the year all animals acquired by purchase, exchange, gift or born alive. Animals disposed of alive by sale or exchange during the year are not deducted. Contrary to the policy of some zoological gardens, no acclimatization period following birth or arrival is allowed.

MORTALITY TABLES FOR 1954

MAMMALS

<u>Year</u>	<u>Total in Collection</u>	<u>Died</u>	<u>Mortality Percentage</u>
1954	737	110	14.92
1953	733	115	15.68
1952	686	119	17.34
1951	691	104	15.05
1950	<u>697</u>	<u>117</u>	16.78
TOTALS	3,644	565	

Average mortality for past 5 years	15.50
Average mortality for past 18 years	18.88

BIRDS

<u>Year</u>	<u>Total in Collection</u>	<u>Died</u>	<u>Mortality Percentage</u>
1954	1,450	278	19.17
1953	1,728	271	15.68
1952	1,586	279	17.59
1951	1,617	250	15.46
1950	<u>1,816</u>	<u>283</u>	15.58
TOTALS	8,197	1,361	
Average mortality for past 5 years			16.60
Average mortality for past 18 years			16.38

DEPARTMENT OF EDUCATION

Herbert J. Knobloch, Assistant Curator
 Janet M. Crawley, Assistant
 Marion P. McCrane, Assistant

FOR THE PAST several years attendance records have been consistently broken by the steadily increasing number of school classes and organized groups visiting the Zoological Park and Farm-in-the-Zoo. Nineteen fifty-four was no exception, as the figures listed below indicate. All are new records.

No. of Schools and Organizations	2,286
No. of Classes and Organized Groups	3,237
Total School/Group Attendance	156,185

The totals for May and June--our biggest months, attendance-wise, by classes and groups--are, of course, included in the grand totals, but are so impressive that they merit special listing.

	<u>May</u>	<u>June</u>
Schools and Organizations	<u>761</u>	<u>727</u>
Classes and Organized Groups	1,144	1,076
Total School/Group Attendance	52,619	51,271

All of the figures for May are new records for any May and also for any single-month period in the Society's history. The totals for June are also new highs for any June.

The number of school and class visits cited above does not necessarily mean that they were always made by different schools, organizations, classes or groups. Some repeated.

VISUAL AIDS--Working with the Department of Publications and Photography, the Education Department assisted in the production of two motion picture films, "Around the Year in the Zoo" and "Lions at Home." The first was concerned with Society activities and the new and interesting arrivals and exhibits in 1954. It was shown to the Members of the Society at the mid-winter meeting and will be used by staff officers as lecture material. The second film, "Lions at Home," was produced in cooperation with Evan J. Anton Productions, Ltd., utilizing African safari footage donated to us last year by Mr. Saul Blickman. This film is complete with sound and has both narration and music throughout. The screams of baboons and lion roars were recorded in the Park for inclusion in the sound track. The film will be distributed by McGraw-Hill Text Films.

In April the musical score of "Introducing the Reptiles" was changed. The track now has more appropriate music, which has much improved it in general.

Our films went out 113 times on rental orders and were seen by 13,210 persons. On 33 occasions they were shown at special meetings before an estimated additional 5,000 persons. Beginning of construction of the new Aquarium at Coney Island caused a great many requests for the aquarium film, "The Life of the Waters," which was produced in 1952. Staff officers used our films on 31 occasions to illustrate talks and lectures and there were six requests for preview prints.

GUIDED TOURS--During the year 122 guided tours were conducted for 4,258 students. A number of special tours were given for diversified groups, including six "touch and sound" tours of the Children's Zoo for small groups of blind children. Eight "behind-the-scenes" tours were conducted for 54 Members of the Society and their guests.

SCHOOL LECTURE SERVICE--Mrs. Ruth Manecke Gruber and Miss Marion McCrane visited 136 schools and organizations and gave 421 talks illustrated by live animals to 39,356 children, a new record for visits and audiences. A touching incident occurred in May when a small girl dying of leukemia in Memorial Hospital asked to see the zoo animals again, especially a kitten, in celebration of her "seven-and-a-half" birthday. Mrs. Gruber took a kitten, a rabbit and a guinea pig from the Children's Zoo to the hospital immediately and made daily visits with the kitten. Mr. Dunton made a photograph of the animal for the child, who died a few days later.

LECTURES--Department members gave 18 lectures and talks before audiences totaling some 1,200 persons, and participated in two radio programs and six television shows.

QUESTION HOUSE--The Question House opened on Easter Sunday, April 18, and closed on Armistice Day, November 11. Through-

out the entire season it was closed only 11 days because of rain. Visitors numbered 53,920, and 15,487 questions were asked, as follows:

Miscellaneous animal questions	11,868
Questions requiring research	51
Platypus questions	1,234
Directional questions	<u>2,334</u>
	15,487

As for several years past, the Duck-billed Platypuses were first in the public's interest, particularly in regard to their breeding.

For the first time the Question House was used jointly by the Education Department and the Facilities Department, serving primarily as an animal information center but secondarily as a salesplace for Zoological Society publications, natural history books, Kodak films and inexpensive cameras.

PERSONNEL--The entire staff of the Zoological Park was shocked by Mildred Levine's sudden serious illness during the middle of June and her death on July 3. Miss Levine had a deep sense of loyalty to her job, to her associates and the work of the Park, and is sincerely missed.

Miss Janet M. Crawley joined the department on July 26, filling the vacancy left by Miss Levine. Miss Crawley is a Wellesley graduate and a conservation major. She is mainly responsible for the visual aids services, but is also working at the Question House and assisting with guided tours.

Mrs. Ruth Manecke Gruber resigned on August 27 and was replaced by Miss Marion P. McCrane on September 13. Miss McCrane is a Penn State graduate and a zoology major. She is in charge of the school lecture work, but also assists with all of the other activities and services of the department.

MISCELLANEOUS--Mr. Knobloch continued to act as chairman of the Zoological Park's Safety Committee throughout the year.

The ninth and tenth In-Service courses for elementary school teachers were given during the spring and fall. In the spring term, since no regular teacher was available for the position, Mr. Knobloch acted as the Board of Education instructor and coordinator for the course in addition to supervising it for the Zoological Park.

During the spring another natural history training course was given for Girl Scout leaders. It was well attended and lasted for seven weeks. At the end of the year Mr. Knobloch was presented with a citation and award (an inscribed bronze Girl Scout statuette) by the Girl Scout Council of Greater New York at its annual meeting, in appreciation of the leader training courses given at the Park over the past four years.

PUBLICATION AND PHOTOGRAPHY

William Bridges, Curator
Dorothy Reville, Assistant
Sam Dunton, Photographer

NOT SINCE the Zoological Park's Printshop was established in the late Nineteen-thirties has the Printer been called upon to prepare, all at once, labels for a major exhibition building. The necessity arose in the spring of 1954 when the modernized Reptile House demanded modernized labelling and the hundreds of existing labels had to be scrapped. Type style throughout the building was changed from black, heavy Franklin Gothic to the more graceful Garamond. For many of the exhibits, transparency labels on film supplanted printed cardboard.

The Printing and Photographic Sections of the department worked together so smoothly that every specimen was labelled on reopening day. Mrs. Reville and Staff Photographer Dunton devised a method of photographing printed labels directly on transparency film, of the correct size, thereby eliminating one stage in the previous way of making these attractive but time-consuming labels. The job involved 54 hand-shaded habitat maps, 81 pieces of printed label copy and 135 transparency negatives, all of which had to be sandwiched between sheets of glass and bound in waterproof tape.

Mr. Dunton turned in 417 negatives during the year, and from James R. Simon we acquired 148 negatives of the animals and scenery of the Jackson Hole Wildlife Park in Wyoming, thus bringing our total photographic collection to about 31,000 negatives. Of unusual interest were Mr. Dunton's photographs of the courtship activities of the Duck-billed Platypuses and pictures by infra-red illumination of the curiously expanded pupil of the eye of the Tokay Gecko.

The Photographic Section sold 1,155 prints to publishers, writers, artists and students, and made 1,114 prints, 28 X-rays, 24 copy negatives, 7 Small Mammal House transparencies and 48 lantern slides for our own purposes. Three photographic exhibits were sent out to public libraries and schools.

The majority of prints made for our own purposes are required for Animal Kingdom, and it is noteworthy that in the past ten years Mr. Dunton has supplied more than fifty of the striking cover pictures of that journal, as well as most of the center-spreads and illustrations for many of the articles.

In the motion picture field, Mr. Dunton shot most of the

footage for a new film on the defenses of reptiles, to be completed in 1955; a large amount of film of activities at the Zoological Park; 200 feet on the courtship of the Platypuses; and footage on animal behavior studies and the flora and fauna of Jamaica Bay, the latter for use on a television program. In addition, he edited a film on the Bylot Island expedition of which the Zoological Society was co-sponsor and "tightened" the film on research performed at the Trinidad field station of the Department of Tropical Research.

At the end of the year the department was gratified by the appointment of Henry M. Lester, a specialist in high speed and stereoscopic photography, as Photographic Consultant of the Society.

In the Zoological Park's Printshop, Mr. Larsen turned out 295 labels, new and reprints, and varnished 608 labels. Form work and labels accounted for 655,312 press impressions.

In the Publications Section, a series of ten four-color postcards was issued for sale by the Facilities Department. Nine anti-litter posters on the theme of "Let's Litter Less" were written and designed. Their amusing cartoon illustrations were drawn by Donald T. Carlisle.

Thirteen papers were published in Zoologica, in a total of 168 pages. The Fifty-eighth Annual Report of the Zoological Society was published on April 19 and the six bi-monthly numbers of Animal Kingdom were issued.

ANIMAL BEHAVIOR

John V. Quaranta, Research Associate

LABORATORY facilities for research in animal behavior were created in the basement of the Heads & Horns Museum in the past year. Some of the research problems involved the following:

Emotional responses of birds as measured by the psychogalvanometer; developmental color vision in aquatic birds; developmental depth perception; pupillary response method for studying color vision utilizing infra-red photography; number abilities test; social distance method for studying responses of animals to different-colored stimuli; influence of auditory signals on exploratory learning of young ducklings; differential responses of snakes to colored stimuli.

Prof. Julian Melhado of Western College, Ohio, was again appointed Summer Research Associate.

Members of the American Psychological Association visited the laboratory on Sept. 4, during their New York meeting.

COMPTROLLER'S DEPARTMENT

Herbert F. Schiemann, Comptroller

PRINCIPAL among the improvements achieved in the Comptroller's Department during 1954 was the installation of a modern system of paying the bills of our vendors. The new system is unique for the Zoo in that it introduced "bookless bookkeeping." We call it that because it does away with long columnar records, requiring thousands of hand-written entries, and substitutes clear and business-like typewritten entries. The work of paying vendors' bills is not only better organized, but also there is considerable time-saving in the method of preparing, at one writing on the typewriter, the check for paying the vendor, the cash journal, the voucher register and, finally, the account distribution ticket.

We are becoming more and more conscious in our accounting work of the new Aquarium, now at last under construction. Many new and interesting problems of accounting and finance are preparing us for the time when the Aquarium becomes an additional operating unit of the Society.

CONSTRUCTION AND MAINTENANCE

Quentin Melling Schubert, Superintendent

RENOVATION of the Reptile House, started in 1953 and completed early in 1954 as far as the main contractual work was concerned, placed on the Department of Construction and Maintenance a heavy spring burden of designing and constructing a score of special exhibits, placing the decor and catching up the inevitable loose ends by Members' Day. Not unexpectedly, the last carpenter and painter left the building just as the first visitors were arriving!

Two major projects designed and supervised by the Park Department were undertaken. The first involved removal of outdated and inefficient heating and drainage systems from the Elephant House, replacement with a complete new boiler and zone heating system, and provision of adequate drainage. The second--still in work at the year's end--was the replacement

of inadequate 4-inch cast iron water lines with new 6-inch pipes and valves throughout the northwestern service section and buildings.

Numerous jobs of greater or lesser complexity were performed by the department, having been developed from our own designs.

New aluminum doors were built and installed in the Giraffe stalls of the Antelope House, thus enabling us to shift these animals during the winter months. The Aquatic Bird House was repaired and repainted after a miscellany of ornamental steel was removed from lower railings and around the cages. The Sea Lion Pool received complete renovation. Purchase of a portable steam cleaner enabled us to remove the old paint and dirt more quickly and completely than ever before, so that new paint could properly adhere to the concrete. The fence and concrete around the pool were repaired and a new aluminum railing set in place, to the great improvement of the appearance of the exhibit. All old bars were removed from the Tapir and Pigmy Hippopotamus tanks and were replaced with aluminum rods, and at the same time the plate glass fronts of the tanks were replaced by sheets of unbreakable Herculite. At the Flamingo Restaurant a new extension was designed and constructed, making provision for enlargement of the kitchen and providing a locker room and toilet. The old ammonia refrigeration system in the Animal Cook Room was removed and replaced by new water-cooled compressor units. A new compressor unit was also installed for the refrigerators in the Animal Hospital.

A troublesome condition on Baird Court has been corrected. The walk running the length of the east side of the Lion House, too narrow to accommodate visitors in great numbers, was widened by the laying of a 9-foot flagstone walk for a distance of 260 ft. A sculptured eagle, newly cast in bronze, was installed on a stone base in front of the Eagle Aviary. One pagoda was built and set up in the No. 5 yard of the Great Apes House. Other units are under construction and will be installed in 1955. The apartment in the Farm-in-the-Zoo was redecorated in readiness for the new resident Farmer. Two tractor train units are being reconditioned during the winter, the three remaining to be put in first-class shape during the spring. A new electric power feeder was installed underground, from the Service Yard vault to the Cafeteria. A fleet of English Fords was purchased as replacement for the worn-out Crosley cars and trucks.

The various animal ranges were treated with lime and fertilizer and seeded during the winter. Two thousand square yards of road patching and resurfacing was done during the summer, and patching of small holes throughout the Park went on almost continuously.

In addition to these miscellaneous jobs, the department executed more than 3,000 work orders during the year.

FACILITIES DEPARTMENT

Edward Kearney, Manager of Restaurants
Edward Quinn, Assistant Manager

IMPROVEMENTS were made at the African Terrace restaurant by the addition of a new stainless steel food service counter consisting of a soda fountain, dessert display unit and a 6-foot griddle for the preparation of hamburgers and frankfurters. Two new continuous-flow soft drink dispensers were added. All food display units were enclosed with stainless steel and glass protector cases, and to provide proper lighting and pleasant atmosphere, eleven new ceiling chandeliers were installed.

Flamingo Terrace restaurant was again modified. The kitchen and pantry were enlarged to provide more adequate working space and new locker and dressing rooms were built for the male and female employees. The dining room was repainted in two attractive colors. A stainless steel tubular safety extension was added to the service counter, two soft drink dispensers were installed at both soda fountains and a new and colorful awning was stretched over part of the terrace for protection during bad weather.

The frankfurter griddles in our very popular refreshment stands had outlived efficiency and were replaced by three of the latest model, consisting of a stainless steel counter with adequate drawers for the storage of rolls and an illuminated sanitary stainless steel and glass protector case.

Our Zoobar service restaurant acquired 300 new chairs for the outside dining terrace and the pantry and service kitchen were redecorated.

The Commissary delivery fleet was rehabilitated, three English Ford trucks and one new Metro panel truck replacing the 1947 Crosley cars.

A year ago the Souvenir Department moved an unprofitable portable stand from the Boston Road gate to a more populated location in the center of the Park, where it has shown a remarkable increase in sales. When the Education Department moved out of the Question House for the winter months it was decided to offer souvenirs and publications in this location rather than let it remain empty and closed, and this venture proved to be quite successful during the short term of its operation.

Balloon sales continued to rise--no pun intended--and a good profit was returned.

MISCELLANEOUS OPERATIONS AND SERVICES

CHILDREN'S ZOO--For nine consecutive years the Children's Zoo has enjoyed a yearly attendance of more than three hundred thousand. Paid admissions in 1954 totalled 333,376 and in addition, 5,611 under-privileged children were admitted without charge, by special arrangement. A slight change in admission price and careful management under Zooperintendent Corrine Dalsgaard resulted in a very favorable financial return--the highest net profit in the fourteen-year-history of the Children's Zoo.

RIDING TRACKS--The loss early in the year of "Tiny," one of our two riding Dromedaries, curtailed track activity considerably, yet the Track under Riding Master Henry Bartels utilized the other riding animals fully and gave 181,920 rides to children. Two young Dromedaries were purchased and are being trained for future use on the Riding Track.

Rides at the pony track under Ponymaster Edmond Foran numbered 171,140.

TRACTOR TRAINS--Rides totalled 592,613 for the six trains, as against 531,071 in 1953.

FARM-IN-THE-ZOO--The Farm-in-the-Zoo was open from April 17 to October 17. Nelson Miller retired on November 14 after ten years of service as Farm Superintendent. He was succeeded by James Coder, former Hospital Attendant.

Part of the CBS television show, "Adventure," originated at the Farm-in-the-Zoo on May 16. A great many fashion and news photographs were made at the Farm.

The attendance of 74,008 includes 17,145 children admitted free in conducted groups.

As in the past, calves and dairy cattle for the milking demonstration were provided by Warren Kinney, a member of the Board of Trustees of the Zoological Society.

Children's Zoo stock and tractor trains were quartered at the Farm during the winter, in addition to the basic farm sheep, cattle and poultry breeding stock.

Eggs were supplied for custard for the Duck-billed Platypuses and other foodstuffs were supplied to the Facilities Department Commissary.

Production at the Farm was; wool, 163 pounds; pork, 4,220 pounds; lamb, 2,510 pounds; poultry, 1,766 pounds; eggs, 1,406 dozen; calves, 2.

THE AQUARIUM

Christopher W. Coates, Curator and Aquarist
James W. Atz, Assistant Curator
Ross F. Nigrelli, Pathologist
Myron Gordon, Geneticist

ON OCTOBER 24 the ground-breaking ceremony for the First Stage of the New York Aquarium took place, and immediately thereafter the contractors moved in and started to work. By the end of the year necessary demolition had been accomplished, the area cleared of valuable sod and topsoil, the excavation for the building completed and the driving of piles for the foundation well started.

Just one year and two days had elapsed since the final approval of the agreement between the City and the Society. During that interval much had to be accomplished, including the completion of the plans and specifications for the First Stage, the adjustment of innumerable details and resolution of many problems involving the building's construction and future functioning, together with the detailed checking of the whole operation by the Bureau of the Budget and other city departments. An unexpected complication was the last-minute substantial upward revision of costs that became necessary, the final figure now being one and one-half million dollars. A great many of our activities of the year were quite naturally concerned with the architects, engineers, contractors, inspectors and administrative officials who all played a vital part in getting the new Aquarium under way.

At our interim Aquarium in the Lion House in the Zoological Park, we have tested, and are still in the process of testing, the effects on fish of several new plastic piping materials as well as various methods of coloring cement. No matter how excellent or economical a particular substance may be, it cannot be used if it proves toxic to our exhibits, and the easiest way to determine this is to let the fish tell us, so to speak, by putting some of the material in question into an experimental tank with living fish.

The nearer we come to the time when we must stock the Aquarium, the more important it becomes for us to strengthen our relations with the various sources of aquatic creatures we wish to exhibit, since most of these places are not commercial establishments and, in any event, do not have in regular supply the kinds of creatures we require. On a Florida trip, Curator Coates therefore made a strong effort to reestablish

contacts with several marine collectors and dealers, as well as to make new ones.

The Casting Pool in the Zoological Park was operated, under our supervision, for five months, from April 17 to September 19 inclusively. The designation "Casting Pool" has proved a misnomer, however, because no casters used the Pool throughout the season. It has instead continued to be popular with children, more than eleven thousand availing themselves of the opportunity to fish. Through the courtesy of Mr. Herman Forster and the services of the New York Conservation Department, the Pool was stocked with 2,700 White and Yellow Perch, Bluegill Sunfish and Black Crappie shortly before opening. In the middle of the season more than 1,000 Sunfishes, seined from the Wild Fowl Pond by our own men, were added to the Pool, and still later some Goldfish from the New York Botanical Garden.

The collection and maintenance of earthworms, crayfish and frogs for the Duck-billed Platypuses was another of our peripheral activities during the year.

EXHIBITIONS--Several noteworthy fishes were exhibited for the first time during the year, among them three species that, so far as we can determine, had previously never been publicly exhibited anywhere. These were the Black Piranha (Serrasalmus niger), the Silver Hatchet Fish (Thoracocharax securis) and the Fairy Bass (Gramma hemichrysos). The Piranha and Hatchet Fish appeared in routine South American shipments made by commercial tropical fish collectors, but the Fairy Bass were specially captured from reefs around Rose Island, near Nassau, through the efforts of Messrs. Roswell Miller and Frank Trevor of Millbrook, New York. Other species new to our collections included the Light-nosed Fish (Barilius christyi), Asiatic Glanis (Silurus cochinchinensis), Sampa (Heterobranchus longifilus), Dwarf Glass Catfish (Eutropiellus debauwi), Masked Corydoras (Corydoras metae) and Sailfin Corydoras (Brochis coeruleus).

For the first time in many years we have exhibited the Spotted Gar (Lepisosteus productus), Striped Barb (Barbus lineatus), Tiger Barb (Barbus partipentazona), Lustrous Hatchet Fish (Thoracocharax stellatus), and the Large-scaled Characin (Chalceus macrolepidotus), all obtained by purchase, as well as the Plains Red Shiner (Notropis lutrensis) obtained from the James R. Record Aquarium at Fort Worth, the Lake Peten Sailfin (Mollienesia petenensis) from Dr. Gordon's expedition to Guatemala, and a species of Myleus from Mr. Joseph Mintzer.

Through the exceptional collecting efforts of Paramount Aquarium, Inc., we have again been able to show South American Lungfish. By exchange with the Steinhart Aquarium we received two pairs of Largemouth Kurper (Tilapia mossambica). These were bred in Hawaii. Later in the year we received several more specimens, this time from Malaya, through the good offices of the World-Wide Aquarium Supply Co., Inc. Dr. S. Tal

of the F.A.O. sent us young Carp of a special Israeli strain that has been introduced into Haiti. During the year Mr. Mintzer also presented us with collections of small marine fishes from Florida, local freshwater ones, and exotic tropical freshwater species. From the New York Botanical Garden we received a large number of Goldfish. Also worthy of mention are a half dozen small Mudspringers that came from west Africa and three species of coral reef fishes from the East Indies, although these specimens did not do well in our tanks.

RESEARCH--As far as concerns our scientific research, one of the outstanding events of the year was the declaration by the National Cancer Institute, one of the National Institutes of Health of the U.S. Public Health Service, of their intent to support the work of the Genetics Laboratory for the next five years, provided that we ourselves concomitantly make certain financial commitments. This expression of confidence in the investigations of Dr. Gordon and his collaborators is extremely gratifying. From 1946 to the present, including the \$17,200 we received for operating the Laboratory during 1954, a total of \$141,439 has been granted to us by this federal agency.

The Genetics Laboratory now has two foci of attention: the various kinds of pigment cell tumors that appear in certain fish hybrids and the piscine thyroid cell tumors, which are also under genetic control. It has been demonstrated that a deficiency of iodine in the aquarium water can initiate the abnormal growth of thyroid cells, but that only certain genetic strains of fishes are thus affected by a shortage of this element. This situation holds for the tumorous thyroid cells found in the kidneys of the Platyfish (Xiphophorus maculatus) as well as those in the region of the thyroid gland itself in the Montezuma Swordtail (X. montezumae). With regard to their response to treatment with iodine, thyroxine and other hormones, the thyroid tumors resemble human goiters in some respects and true thyroid cancers in others. One of several studies on the pigmented tumors is that of Mrs. Sylvia Greenberg, under the direction of Dr. Gordon and Dr. Milan J. Kopac of New York University. By means of tissue culture, the tumors are being grown outside the body of the fish, where various cytochemical and micrurgical techniques can more easily be applied to them. At present, Mrs. Greenberg is concentrating on the enzymes involved in pigment formation in both normal and tumorous cells.

The investigation of the production of electricity by the Electric Eel received a great stimulus when a method of working with a single isolated electroplaque was devised. Each electric organ consists of thousands of these fundamental units, each of which regularly develops a small electric potential. It is now possible even to insert micro-electrodes into different parts of the tiny electroplaque in order to discover just what is going on inside. Moreover, the technique

has been perfected to a point where quantitative data may regularly be obtained. By this means a further analysis of the acetylcholine system, which is responsible for the elementary process by which bioelectric potentials are generated, has been accomplished. For example, the enzyme, acetylcholinesterase, has finally been distinguished from the acetylcholine receptor, another substance essential to the system. This work is being carried on by Dr. David Nachmansohn and his colleagues at the College of Physicians and Surgeons, particularly by Dr. Mario Altamirano, together with Curator Coates.

At present Dr. Nigrelli is engaged in studies of the diseases and parasites of several food and game fishes from different parts of the world. Locally he is collaborating with the State of New York Conservation Department in its efforts to determine why the Weakfish has so declined in numbers along our coast. An attempt is being made to determine the cause of the liver tumors (hepatomas) occurring in Rainbow Trout in a hatchery in Pennsylvania. On the Pacific Coast large numbers of certain populations of the Sand Sole exhibit peculiar tumors, and Dr. Nigrelli has been asked to diagnose this condition. Finally, his help on a protozoan disease afflicting one of the economically important Tilapia of East Africa has been sought.

It would seem that after all these years no fundamentally new causes of death of fishes should turn up, but in fact, they do. This year Dr. Nigrelli discovered that actinomycosis was the cause of death of some of our Blind Cave Characins. This is the first time that any of the actinomycetes, which are mold-like bacteria, have definitely been found to be pathogenic to fish.

With Dr. Sophie Jakowska of the College of Mount St. Vincent and Dr. Harold Sparrow of the Brookhaven National Laboratory, Dr. Nigrelli is analyzing the effects of radiation on salamanders. Since the advent of the atomic bomb, intensive studies on the cause and cure of radiation sickness have been going on, and as a necessary background for these the effects of radiation on other, lower vertebrates also need to be studied. Salamanders are especially useful because their large cells are ideal for microscopic observation. They are being subjected to different doses of X-rays and various types of thermonuclear radiation at Brookhaven; then the effects, particularly on the blood, are being observed in our laboratory in the Lion House. It has been found that salamanders can withstand several times as much radiation as, say, mice, and that keeping them at low temperatures makes them even more resistant.

Dr. Nigrelli spent four weeks at the Lerner Marine Laboratory of the American Museum of Natural History in the British West Indies, where he continued studies on Holothurin and on the tumors found in certain natural populations of fishes there. He also made some biochemical investigations of the

island's sponges and discovered a giant dinoflagellate, parasitic on the Portuguese Man-of-War, that seems to be an undescribed species. Dr. Gordon conducted a successful one-month expedition to Guatemala and British Honduras. Both living and preserved Platyfishes were brought back from three different drainages. One of these was the Rio Ucumacinta, the only one of the seven great river systems in which the Platyfish (Xiphophorus maculatus) occurs from which living specimens had never been collected. Since the Platyfish that live on either side of the Ucumacinta show striking differences in their genetic behavior, the results of breeding experiments with the new stock are awaited with keen interest.

Under the direction of Dr. Gordon, the reproductive behavior of two poeciliid fishes, one extremely common and the other extremely rare, has been subjected to critical analysis. Through exhaustive behavioral and histological observations on the Guppy, especially the female, Dr. Patricia Kadow of the College of St. Elizabeth has established some of the several different conditions prerequisite to successful mating in that species. Similarly, Mr. Donn E. Rosen has, by means of extensive anatomical and behavioral studies, elucidated the mode of reproduction of Tomeurus gracilis, a fish that lays single eggs fertilized while inside the female. Dr. Gordon has been able to maintain a pair of these delicate fish in the Laboratory for more than six months--the first time they have been kept in captivity for any length of time.

An extensive review of the oxygen requirements of fishes was prepared by Assistant Curator Atz. This provides a useful summary of how much dissolved oxygen various species must have and thus helps to indicate what kind of conditions are necessary to maintain them in captivity.

COLLABORATION--Public aquariums remain much in the public eye; many cities all over the world have either recently built or are planning to build aquariums. Our advice on construction and maintenance of the great majority of these institutions has been sought at one time or another. For example, during the past year we were visited by administrators, architects and engineers seeking information for the planning of new public aquariums at Karachi, Montevideo, Santo Domingo, Calgary, Cleveland and Philadelphia; for proposed privately maintained, commercial aquariums at Lake George and Atlantic City; and for the remodeling or reconstruction of already established buildings at Detroit and the Marine Institute of the University of Puerto Rico. With the planners and administrators of the then unfinished James R. Record Aquarium of Fort Worth, Curator Coates held on-the-spot consultations in the aquariums at Cincinnati and Columbus. He was consulted by Philadelphia. In addition, advice on the aquariums planned for Vancouver and Quebec was furnished by mail, and Curator Coates has been appointed to the Aquarium Planning Committee of Miami Beach.

Information on the operation of closed circulatory systems for the maintenance of fish in captivity was provided the Departments of Zoology of Yale and Columbia Universities, the Bingham Oceanographic Laboratory and the Albuquerque Branch of Game-fish and Hatcheries of the U.S. Fish and Wildlife Service. Living aquatic animals or plants were provided Dr. N. Tinbergen of Oxford University, Dr. H.J. Koch of the University of Louvain, the Teachers' College and Botany Library of Columbia University, and the Charles F. Kettering Foundation at Yellow Springs, Ohio. As in previous years, we have cooperated with the Department of Marine and Aviation, New York City; the Federal Security Agency, Pure Food and Drug Administration; the Department of Health, New York City; the Fish and Wildlife Service, Department of the Interior; and the Conservation Department, State of New York.

Collaborators working with the Aquarium during the year were:

- Drs. David Nachmansohn, Mario Altamirano, Harry Grundfest, Irwin B. Wilson and Walter Schleyer, Department of Neurology, College of Physicians and Surgeons, Columbia University
- Dr. M. Vertner Brown, College of the City of New York
- Drs. Horace W. Stunkard, Harry A. Charipper and Milan J. Kopac, New York University
- Dr. Eli D. Goldsmith, New York University Dental College
- Dr. Aubrey Jorban, Barnard College, Columbia University
- Dr. Sophie Jakowska, College of Mount St. Vincent, New York
- Dr. Alfred Perlmutter and Mr. Irwin Alperin, Conservation Department, State of New York
- Dr. James R. Westman, New Jersey Agricultural Experiment Station, Rutgers University
- Dr. Recai Ermin, University of Istanbul
- Misses Francesca R. LaMonte and Priscilla Rasquin, Drs. Charles M. Breder, Jr., Lester R. Aronson and T. C. Schneirla, American Museum of Natural History
- Drs. Daniel Merriman and Grace E. Pickford, the Bingham Oceanographic Laboratory, Yale University
- Drs. Caryl P. Haskins, Seymour Hutner, Paul A. Zahl and Luigi Provasoli, Haskins Laboratories, New York
- Dr. Olga Berg, Research Associate, Barnard College, Columbia University
- Dr. Harold Sparrow, Brookhaven National Laboratory, Long Island
- Dr. Douglas G. Humm, University of North Carolina
- Drs. Harry Sobotka and J.D. Chanley and Mr. Herman Baker, Department of Chemistry of Mount Sinai Hospital
- Dr. T. D. Sullivan, S.S.E., St. Michael's College, Winooski, Vermont
- Dr. Julius Feldmesser, Central Florida Experimental Station, U.S. Department of Agriculture

Mr. George Fassuliotis, U.S. Department of Agriculture,
 ARS-Nematology Section, Hicksville, Long Island, and
 New York University
 Dr. J.B.S. Haldane, University College, London
 Dr. Carl L. Hubbs, Scripps Institution of Oceanography
 Mr. Morton Padnos, Protista Research Laboratory, New York
 Mr. Hugh Gordon, Columbia University
 Dr. Samuel Bieber, Wellcome Laboratories, Tuckahoe
 Dr. Alfred A. Angrist, Queens Hospital Center
 Dr. Helen Vishniac, Queens College and Haskins Labora-
 tories
 Dr. Abner I. Weisman, Jewish Memorial Hospital and New
 York Medical College
 Dr. James Miles O'Brien, Yale University

Drs. Nigrelli and Gordon gave their courses on fish dis-
 eases and fish genetics, respectively, at the Graduate School
 of Arts and Sciences of New York University. Miss Patricia Ka-
 dow received the degree of Doctor of Philosophy and Mr. Klaus
 D. Kallmann that of Master of Science under Dr. Gordon's spon-
 sorship. The following candidates for advanced degrees from
 New York University are now working under Drs. Nigrelli or
 Gordon:

Mr. James W. Atz, New York Zoological Society
 Mrs. Sylvia Greenberg
 Mr. Theodor R. Marcus
 Mr. George S. Pappas, Iona College, New Rochelle, N. Y.
 Mr. Alfonso N. Petrocci, Onyx Oil and Chemical Company,
 Jersey City
 Mr. Henry Vogel, New York City Department of Health
 Mr. George Wendt, Burroughs Wellcome & Co., Inc., Tuck-
 ahoe
 Mr. Marvin Weinstein, Squibb Pharmaceutical Company, Inc.

Dr. Gordon is also acting as joint advisor for Miss K.
 France Baker of the Genetics Laboratory, who is a candidate
 for the Ph.D. degree at Columbia University.

PUBLICATIONS--The following scientific and popular articles
 by members of the staff appeared during the year:

Mr. Coates

El Gimnoto o Anguila Electrica. Lo Mejor del Catholic Digest,
 Vol. 2, No. 5, pp. 97-102.
 Pyrrhulina Available from Amazon Basin. Fish Culturist, Vol.
 33, No. 6, p. 44.
 Albino Fish Are Harder to Maintain. Indian Aquarist, Vol. 2,
 No. 2, p. 47.
 Actinozoa. Encyclopedia Americana, Vol. 1, pp. 107-108.
 Amphioxus. Encyclopedia Americana, Vol. 1, pp. 589-590.

- Amphipoda. Encyclopedia Americana, Vol. 1, p. 590.
- Sturgeon. Encyclopedia Americana, Vol. 25, pp. 755-757.
- Belontia signata (Guenther) Comb-tail from Ceylon a Bit Temperamental. Fish Culturist, Vol. 33, No. 9, p. 68.
- Apistogramma ramirezi. Indian Aquarist, Vol. 2, No. 3, pp. 74, 94.
- Feather Tail Comes from Congo Area. Phenacogrammus interruptus. Fish Culturist, Vol. 34, No. 1, pp. 1-2.
- The Kick of an Electric Eel. Pp. 239-246 of "New Horizons. A Collection of Readings in Communication," edited by Alice Babcock and Paul Stauffer. Pacific Union College, Angwin, California.
- What We Are Learning about Electric Fishes. Animal Kingdom, Vol. 57, No. 6, pp. 182-186.
- Lemon Tetra a Beauty and Easy to Manage. Hyphessobrycon pulchripinnis Ahl. Fish Culturist, Vol. 34, No. 4, p. 27.
- Fishes of the World. With James W. Atz. Pp. 1391-1640 of "The Animal Kingdom," edited by Frederick Drimmer. Greystone Press, New York.
- Activity in Electrogenic Organs of Knifefishes. With Mario Altamirano and Harry Grundfest. Science, Vol. 120, No. 3125, pp. 845-846.
- Weekly column on tropical fish in the New York World-Telegram and Sun continued for twenty-fourth year.

Mr. Atz

- 50-Minute Nap under Water. Animal Kingdom, Vol. 57, No. 2, pp. 58-59.
- Most Dangerous to Man? Animal Kingdom, Vol. 57, No. 3, pp. 75-79.
- The Peregrinating Tilapia. Animal Kingdom, Vol. 57, No. 5, pp. 148-155.
- Orientation in schooling fishes. Pp. 103-130 of "Proceedings of a Conference on Orientation in Animals." Office of Naval Research, Washington, D.C.

Dr. Nigrelli

- Final Report on the Society's Own "Point Four" Program. Animal Kingdom, Vol. 57, No. 1, pp. 24-25.
- The Fish in Biological Research. Bull. for Medical Res. (Nat'l Soc. Medical Res.), Vol. 8, No. 6, pp. 2-5.
- Some Longevity Records of Vertebrates. Trans. N.Y. Acad. Sci., Ser. II, Vol. 16, No. 6, pp. 296-299.
- Tumors and Other Atypical Cell Growths in Temperate Freshwater Fishes of North America. Trans. Amer. Fish. Soc., Vol. 83, pp. 262-296.
- Morphology and Life History of Colpoda maupasi, Bensonhurst Strain. With Morton Padnos and Sophie Jakowska. Journ. Protozoology, Vol. 1, No. 2, pp. 131-139

- Thyroid Cell Origin of Spontaneous Adenocarcinomas of the Kidneys in Fishes. With K. France Baker, Olga Berg, Aubrey Gorbman and Myron Gordon. Proc. Amer. Assoc. Cancer Res., Vol. 1, No. 2, p. 3. Abstract.
- Spontaneous Neoplasms in Fishes. VIII. Pearl-like Bodies in the Internal Organs of Climbing Perch with Papillomas of the Skin. With Sophie Jakowska. Proc. Amer. Assoc. Cancer Res., Vol. 1, No. 2, p. 35. Abstract.
- Studies on Colpoda. IV. Reorganization of the Silverline System in Colpoda maupasi (Bensonhurst Strain). With Morton Padnos and Sophie Jakowska. Journ. Protozoology, Vol. 1, Suppl., p. 13. Abstract.
- A New Henneguya in the North Atlantic Weakfish, Cynoscion regalis. With Sophie Jakowska and Irwin Alperin. Journ. Protozoology, Vol. 1, Suppl., p. 13. Abstract.
- Histopathological Changes in Triturus viridescens after X-irradiation, with Survival Prolonged by Low Temperature. With Sophie Jakowska. Anat. Rec., Vol. 120, No. 3, p. 746. Abstract.
- Studies on Colpoda. V. Resting Cysts Induced by Cold-treatment of Octogenic Reproductive Cysts in Colpoda maupasi (Bensonhurst Strain). With Morton Padnos and Sophie Jakowska. Anat. Rec., Vol. 120, No. 3, pp. 814-815. Abstract.
- Studies on Colpoda. VI. The Bauer-Feulgen Reaction in Trophic and Encysted Colpoda maupasi (Bensonhurst Strain). With Morton Padnos and Sophie Jakowska. Anat. Rec., Vol. 120, No. 3, p. 815. Abstract.

Dr. Gordon

- The Influence of the Mating System upon Normal and Atypical Pigment Cell Growth. Acta Unio Internationalis Contra Cancrum, Vol. 9, No. 4, pp. 787-793. (1953).
- Inheritance in the Siamese Fighting Fish (Betta splendens). Parts 1-5. Aquarium Journ., Vol. 25, Nos. 1-3, 5-6, pp. 16-24, 40-46, 64-69, 116-122, 143-148.
- Shrimp from the Desert. Animal Kingdom, Vol. 57, No. 2, pp. 43-46.
- The Unique Home of the Pigmy Swordtail, in Mexico. Tropical Fish Hobbyist, Vol. 2, No. 4, pp. 8-12, 22.
- In the Footsteps of Lieutenant Couch. The Aquarium, Vol. 23, No. 5, pp. 144-147.
- A Type of Inheritance that Mendel Never Knew. "Multiple Allelism"--I. Aquarist and Pondkeeper, Vol. 19, No. 4, pp. 84-86.
- The Fish that Likes to Fight. Science Digest, Vol. 36, No. 3, pp. 59-63.
- Duckweeds, the World's Tiniest Flowering Plants. Tropical Fish Hobbyist, Vol. 3, No. 1, pp. 14-17.
- Selective Matings and Development of Melanomas. Proc. Second Nat'l Cancer Conf., pp. 1067-1073.

- An Outline of the Courtship and Mating Behavior in some Viviparous Fishes. Tropical Fish Hobbyist, Vol. 3, Nos. 2-3, pp. 13-16, 44, 35-38.
- Beware the Fungus! Tropical Fish Hobbyist, Vol. 3, No. 2, pp. 21-24.
- Betta splendens Plays a Part in "The Dragon Murder Case." The Aquarium, Vol. 23, No. 12, pp. 364-365.
- The Genetics of Fish Diseases. Trans. Amer. Fish. Soc., Vol. 83, pp. 229-240.
- Comparative Effects of Thyroidal Stimulants and Inhibitors of Normal and Tumorous Thyroids in Xiphophorin Fishes. With Olga Berg and Aubrey Gorbman. Cancer Res., Vol. 14, No. 7, pp. 527-533.
- Biometry of Seven Natural Populations of the Platyfish, Xiphophorus maculatus, from Central America. With Hugh Gordon. Zoologica, Vol. 39, Part 2, pp. 37-59.
- Transplantation of the Sc Melanoma in Fishes. With Theodor R. Marcus. Zoologica, Vol. 39, Part 3, pp. 123-131.
- Thyroid Cell Origin of Spontaneous Adenocarcinomas of the Kidneys in Fishes. With K. France Baker, Olga Berg, R.F. Nigrelli and Aubrey Gorbman. Proc. Amer. Assoc. Cancer Res., Vol. 1, No. 2, p. 3. Abstract.

PERSONNEL--Mr Coates was once again appointed Chairman of the Aquarium Committee of the American Association of Zoological Parks and Aquariums. For the annual meeting of this group he organized and participated in a symposium and discussion on new aquariums in the United States. Mr. Coates was made Honorary Fellow of the International Oceanographic Foundation and was elected as an Honorary Life Member of the Bronx Aquarium Society. Mr. Atz was elected to Sigma Xi, the Scientific Research Society of America.

Dr. Nigrelli served as Recording Secretary of the New York Academy of Sciences and was elected Vice-president for the coming year. A symposium on Age Determination in Animals, sponsored by the Academy, was organized by Dr. Nigrelli. He was made a member of the Committee on Animals Obtained from Nature of the Institute of Animal Resources, the National Research Council, and was reappointed Scientific Consultant of the Bingham Oceanographic Laboratory of Yale University. Dr. Gordon was appointed Research Associate in the Department of Zoology of Columbia University and representative of the American Society of Ichthyologists and Herpetologists on the council of the AAAS.

William O'Sullivan was returned to duty at the Aquarium from the Maintenance Department on May 28.

Members of the staff gave papers and lectures and participated in discussions at the following institutions and places:

Sixth International Cancer Congress, Sao Paulo, Brazil
American Association for Cancer Research, Atlantic City

American Society of Zoologists, Chapel Hill meeting
American Society of Zoological Parks and Aquariums, Baltimore meeting
New York Academy of Sciences, symposium on age determination in animals
Seventh Brookhaven Symposium in Biology
The Johns Hopkins School of Public Health
Department of Genetics, McGill University
Department of Biology, Princeton University
The Johns Hopkins University, advanced genetics course
Telecolor Clinics, American Cancer Society, CBS-TV
(closed circuit)
Montreal Aquarium Society
New Jersey Aquarium Society
Long Island Dolphins, first annual dinner
Flatbush 12:45 Luncheon Club
Goldwater Memorial Hospital for Chronic Diseases

DEPARTMENT OF TROPICAL RESEARCH

William Beebe, Director Emeritus
Jocelyn Crane, Assistant Director
Henry Fleming, Entomologist
Rosemary Kenedy, Research Assistant

GENERAL ACTIVITIES OF THE YEAR--In 1954 the Department spent six months in the field at Simla, the Zoological Society's Field Station in Trinidad, B.W.I., and at Moengo, Surinam. The remainder of the year the staff worked in the laboratory in the Zoological Park.

CHANGES IN STAFF--In acknowledgement of her scientific activities, the status of Miss Kenedy was changed to that of Research Assistant.

FIFTY-SECOND EXPEDITION--The fifth season of occupancy of Simla and St. Pat's extended from December 1 to May 19. The staff sailed from New York on the Alcoa-Puritan on November 13 and flew north by Pan-American plane on May 20. The stops made on the trip south were San Juan, Mayaguez and Ponce, Puerto Rico; La Guaira, Puerto Cabello and Guanta, Venezuela; Moengo, Surinam, and Port-of-Spain.

ADDITIONAL LAND ACQUIRED IN TRINIDAD--The three springs which supply Simla with fresh water are situated three-quarters of a mile up the eastern slope of the valley, at an elevation of

eleven hundred feet. Because of threatened cutting of timber for charcoal and consequent erection of huts for human occupancy near the spring, sixteen additional acres, known as the Boodhoo Tract, were purchased by Dr. Beebe and presented to the Zoological Society. All danger of water curtailment or contamination is thus avoided. This tract contains some of the tallest jungle trees on any of the property.

GIFTS--To the generosity of Mr. Redfield Vose the Department is indebted for the Surinam trip, and to Mrs. C. Reed Cary for assistance in butterfly experimental work.

CONSERVATION--The general aspects of protection of wild life in Trinidad are decidedly encouraging. The Scarlet Ibis, locally known as the Flamingo, had an excellent year, protected by a good closed season. A conservative estimate of the breeding birds in the Caroni marshes is eight to ten thousand Ibises. Powder and shot are so expensive that on the first day of the open season, when the outrageous bag of fifteen birds is allowed by law, the average take of the few hunters was a two-bird bag.

The only blot on Trinidad conservation was reported by a Port-of-Spain business man, who had chased and killed sixty-nine deer with his pack of English fox hounds. The new Zoo in the Botanical Gardens is doing excellent work in arousing interest in wild life.

RELATIONS WITH INSTITUTIONS--Dr. Wilbur G. Downs of the Trinidad Regional Virus Laboratory, under the jurisdiction of the Rockefeller Foundation, is still utilizing the St. Pat's estate as a Field Station, with excellent results. Out of 20,000 mosquitoes caught or reared, only six hundred malaria-carrying Anopheles have been recorded. Relations with the Trinidad Government, the Alcoa Steamship Company and the United States Naval Base continue cordial and helpful.

Dr. Guillermo Zuloaga, Vice-president of the Creole Petroleum Corporation, writes that "The Beebe-Crane film, Curioseando en las Selvas Venezolanas, has easily been the most successful movie we have ever undertaken. Approximately 500,000 people have seen it, and it continues in demand."

CONSTRUCTION--All boundaries were cut and cleared, and parts of the St. Pat's boundary were surveyed and re-marked with cement posts. A new suite of rooms was erected beyond the generator room, complete with bathroom. The Station now has accommodation for three extra workers besides a resident manager.

VISITORS--The list of visitors to Simla in 1954 was a long and worthy one. Mr. and Mrs. Laurance Rockefeller spent a day at Simla, together with Mr. and Mrs. Roger Firestone and Mr. and Mrs. Kenneth Brownell. Other visitors were Admiral Sir

Eric and Lady Fullerton, Mr. and Mrs. John Crocker, Dr. and Mrs. True of the Naval Base and Dr. and Mrs. Harold Lovell.

Mr. Redfield Vose and Miss Polly Evans flew to Trinidad in Mr. Vose's plane and spent carnival week at Simla. Mr. and Mrs. Roy Howard paid a visit, also Mr. Vanderbilt Webb, Consul General and Mrs. Maddox, the Sam Duryeas, the Conrad Nagels, Mrs. Hilery Meijer of Surinam, Commissioner and Mrs. C. E. Hammond, Mr. William M. Chadbourne, Mr. and Mrs. McKee of the Aluminum Company and Dr. and Mrs. Herklots, head of the Imperial College. Dr. Berta Lutz of the Museu Nacional of Rio collected frogs near Simla for several days. The Department welcomed its Alcoa friends, Mr. and Mrs. Edward Collins, Captain and Mrs. Milton Miles and Mr. Frank K. Bell.

SCIENTIFIC ACTIVITIES--Mr. Fleming is occupied with a thorough review of the systematics of the Euechromidae, a family of day-flying moths.

Dr. Beebe and Miss Kenedy are well along on a monograph of the known life histories, especially behavior, of the Euechromidae.

Dr. Beebe is engaged on specific aspects of the ecology of the birds of the Arima Valley, especially with regard to their relationship to other native vertebrates and to present precise niches occupied by certain species.

One important scientific event was the discovery of a nest of the Mossy-throated Bellbird, Procnias averano carno-barba, the first known nest of any species. A second nest with a single egg was later found by Dr. Downs.

The study of two very different selective attractants for insects not only saved us a great deal of time and energy in searching for desired species, but they were of real scientific interest in themselves. One attractant was Heliotropium indicum and the other was an indirect result of a disease of tangerine trees.

Miss Crane is currently completing the manuscripts of two studies of arthropods. The first concerns the geographical variation in morphology, ecology and behavior of a single species of Fiddler Crab (genus Uca) which ranges from Cape Cod to Rio de Janeiro. The second, based on observational and experimental work in the insectaries of the Society's Trinidad Field Station, deals with the comparative behavior of two species of red-and-black Heliconius butterflies. Field work in progress deals with similar studies of other butterflies, including Papilio, Morpho and additional species of Heliconius. It is expected that these investigations will shed light both on the phylogeny of butterflies and on the organization of insect behavior.

TRIPS--Three trips were made from Simla during the present season. Miss Crane extended her studies of Fiddler Crabs to Brazil, spending eighteen days and covering 6,500 miles, col-

lecting some 1,500 selected specimens, and taking moving pictures and notes. Field work was done at Rio de Janeiro, Sao Salvador, Recife, Fortaleza, Sao Luiz and Belem. Miss Crane accomplished all her objectives and accumulated a large amount of valuable data.

A one-day trip was made to the Oropouche Caves by Mr. Fleming and Miss Kenedy. They report Guacharos or Oilbirds in all three chambers, to the number of at least 125 birds.

The third trip was a major one to Moengo, Surinam, and again this was made possible by the generosity of Redfield Vose. This year the department succeeded in transporting fertile females and eggs of Heliconius butterflies both by sea and air, to Simla, where the eggs were hatched and reared. The results proved conclusively that these butterflies are polymorphic, the progeny of a single female containing a diversity of forms, some of which have heretofore been considered as valid species.

CONTRIBUTIONS--1954

- 944-Annual Report of the Department of Tropical Research for 1953. William Beebe. Pp. 43-46.
- 945-The Story of a Curious Caterpillar. William Beebe. Animal Kingdom, Vol. 57, No. 1, pp. 2-5.
- 946-They Paint Living Butterflies. Trinidad Guardian, April 4.
- 947-Migration Night. William Beebe. Animal Kingdom, Vol. 57, No. 2, pp. 54-57.
- 948-A Revision of the Genus Eubaphe (Geometridae). By D. S. Fletcher. Zoologica, Vol. 39, No. 13, pp. 153-166.
- 949-The Nest and Egg of the Black-winged Bellbird. William Beebe. Animal Kingdom, Vol. 57, No. 4, pp. 115-119.
- 950-Spectral Reflectance Characteristics of Butterflies from Trinidad, B.W.I. Jocelyn Crane. Zoologica, Vol. 39, No 8, pp. 85-115.
- 951-Housekeeping for Butterflies. Jocelyn Crane. Animal Kingdom, Vol. 57, No. 5, pp. 138-143.

MEMBERSHIP

Donald T. Carlisle, Chairman
Membership Committee

MEMBERSHIP RESULTS in 1954 were slightly more satisfactory than in any year since 1945, although they were but fractionally ahead of 1953. Dues revenues of \$45,665 were collected--the highest in the Society's history--and this result was obtained at a lower cost than for any year since 1950. A much higher cost in 1953 was due to the fact that a substantial part of promotional funds for that year was spent in modernizing our mailing list. This expense was not necessary in the year just passed.

Numerically, the Society made a slight gain in both Annual and Contributing totals, in both cases more than enough to offset our losses arising from deaths and resignations and the lapsing memberships of individuals who did not pay their dues. We lost 51 members by death during the year, and 249 persons either resigned or were dropped for non-payment of dues. This latter figure, which interestingly is to be compared with a 248 total in 1953, is still inexplicably high. We are planning some exploratory work for the coming year which we hope will disclose at least some of the reasons for heavy membership turnover.

In the fall, a committee was appointed to help in membership promotion. A number of encouraging suggestions came out of its single meeting, but nearly all of these related to the spring, summer and early fall periods and therefore could not be put into immediate execution. This group will be re-activated in 1955 and proceed we hope with the many worthwhile ideas on the table. Among other things, it is planned to undertake a more aggressive membership solicitation through the many clubs and organizations that are making a "Zoo expedition" a regular part of their calendar. These parties make us many friends but not enough cash customers--obviously the result of our own modesty.

It is also the plan of the Committee appointed last fall to endeavor to obtain greater assistance from present members in the recruiting of new ones. Our current friends are, or should be, our best source of new supporters.

We are gratified to be able to report that on its 1954 basis, membership promotion produces enough in dues to pay its entire costs plus the costs of all member services, with something left over to defray the expense of some other oper-

ations. If we could materially decrease membership turnover, a general responsibility shared by us all, the net profit available for the Society's use would be appreciably greater; it would have been more than \$3,000 greater in 1954.

SUMMARY OF MEMBERSHIP

Benefactors	6
Founders in Perpetuity	14
Founders	15
Associate Founders	7
Patrons	27
Life Members	373
Contributing Members	750
Annual Members	1,839
Honorary Members	2
Fellows	86
Research Associates	2
Corresponding Members	<u>8</u>

Total. 3,129

Corrected to January 1, 1955

THE CONSERVATION FOUNDATION

Note: Again members are urged to write to the Conservation Foundation for the 1954 report of that organization's achievements during the past 12 months. The address is 30 East 40th Street, New York 16, and copies of the report are immediately available. This report is summarized here.

THE RISING TIDE of interest and action, both internationally and nationally, in resource and population problems is a matter of extraordinary encouragement. It is natural, no doubt, that an organization like ours views and measures the sequence of events within the time-span of its own existence--in our case seven years. Forces far beyond the influences of any one organization or even groups of organizations are in motion. The dynamic world problem of rapidly rising populations and the adequacy of natural resources is compelling ever-growing attention.

On the international scene, within this seven-year period two world meetings, the first of their kind, have been held under the auspices of the United Nations--a meeting in 1949 on resources, and subsequently, the meeting last year on populations. Governments have always given their attention to agricultural and other resources--now several are directly engaged in programs dealing with population growth. A constantly increasing number of international meetings composed of both governmental and independent agencies are being held.

On the national level, within even the last two years, a number of significant events have occurred, including, for instance, the recent Mid-Century Conference on Resources for the Future, the Watershed Congress, the first of its kind, together with accelerated cooperative action between many types of independent conservation agencies. In turn, we in this country are giving greater consideration to the implication of our own rapid population growth and new independent agencies have come into existence in an effort to deal with the problem from a world point of view.

There are those who say these activities are "too little and too late." Books have appeared written on the prophetic and dismal theme that our civilization is incapable of resolving these fundamental problems. One must believe that these great questions can be resolved. Our organization takes the point of view that our task is to drive ahead with all possible energy to the purposes to which we are dedicated. Our

work is only a part of the tide of interest and action--that we well know--but the tide is on the rise.--Fairfield Osborn

RESEARCH IN 1954--During the past year we brought to conclusion the Soil Erosion Survey of Latin America, a broad survey published with descriptive text and maps. For the first time the character and extent of soil deterioration throughout the whole region have been graphically presented. Carefully controlled distribution has placed this publication in the hands of key people and agencies capable of launching soil conservation programs in the countries covered.

Our Survey of Marine Resources continued throughout 1954 and should reach completion in the coming year. A survey of the need for additional hydrologic data is now being planned. Consideration is now being given to a study of actual progress in land conservation, so broad in comprehension that it divides into several projects, some regional, bearing on range land problems, soil fertility problems and erosion control activities. The terms of this study are described in our report for 1954.

The three inter-related studies analyzing the implications of Jamaican population trends and resource use are nearing completion. At the University of Chicago we have started an estimate of the socio-economic implications of fertility control.

In association with the New York Zoological Society two projects were initiated in 1954 for the study and protection of wildlife. The first of these is the study of Bighorn Sheep, which will be the first over-all compilation of information regarding the present condition of these animals and their ranges. It will result in recommendations for their long-term preservation. The second is an ecological study of the smaller mammals of the Western Plains, with emphasis on the Prairie Dog, the Blackfooted Ferret and other life-associations of these animals, including predators and vegetation. Among its purposes is the aim to put an end to the deliberate eradication of some of these smaller animals in disregard of their values both ecologically and aesthetically.

EDUCATION IN 1954--During the year a report was published of the Plymouth (New Hampshire) High School Teachers' Training Program. This three-weeks' workshop course was sponsored by us in the summer of 1951 for the purpose of developing a program of conservation teaching by integration with all major disciplines in the curricula of all school classes. It was obviously impossible to evaluate the results of the experiment until after its application. Mr. Arthur S. Rollins, the Plymouth Superintendent of Schools, has made a check for the school years 1952-53 and 1953-54, and reports thereon in a booklet published by our organization and distributed to more than 14,000 members of the National Association of Secondary

School Principals and several hundred State Conservation and Education Departments, libraries and individuals.

In the audio-visual field of action, our Elementary Conservation Series was completed in 1954. There are three six-minute color films in the series designed for teaching primary grade pupils: "Your Friend the Forest (Save It or Destroy It);" "Your Friend the Soil (Keep It or Lose It)" and "Your Friend the Water (Clean or Dirty)." These films combine 30% animation with 70% live photography. They employ sound effects liberally but use a minimum of dialogue. Since there are almost no conservation films for primary grade teaching, it is hoped that these novel "short-shorts" will fill the gap. This series is now available through Encyclopedia Britannica Films, Inc., accompanied by a Teacher's Guide.

We released our new color film "The Making of the River" in April. This picture won honorable mention in the national contest of the Photographic Society of America. Coronet Instructional Films will distribute the 16 mm. version, and a color version in 35 mm. has been made for commercial release to "art theaters."

During the year "Nature's Plan," part one of our "Living Water Series," was shown at the Edinburgh Film Festival. We were notified that "The Web of Life" had previously (in 1951) won the award of the National Association of Conservation Education and Publicity, this information having been inadvertently mislaid!

A 1954 grant from the Old Dominion Foundation enabled us to explore further the possibilities of conservation programs on radio and television. Several projects in this area are in development--a series of twenty-six TV films, based largely on Conservation Foundation footage, and a localized weather program on either TV or radio involving conservation information. The former is already being promoted for a chain sale by Thomas Craven Productions. The weather program is being considered by several New York stations.

In March the Education Department entered into an agreement with Dr. Charles E. Lively of the University of Missouri whereby he would undertake a critical inventory of conservation teaching at the college-university level, this study to be completed by September 15, 1955. Dr. Lively and his assistant, Dr. John Preiss of Michigan State University, began work intensively in May. Concurrently we will conduct a study of the employment opportunities for graduates of conservation courses, this work to be under the direction of Roger Hale.

During the year the Yale Conservation Program received a grant of \$6,800 from the Conservation Foundation for 1955 scholarships.

WORK WITH OTHER GROUPS--While the backbone of our work consists of our research and educational projects--completed, in progress or in plan--we find ourselves constantly engaged in

a number of additional activities. They are too numerous for full listing, yet a few may be cited here in order to illustrate how our organization is trying to be of service on as broad a front as possible.

Our projects in water control led to a co-sponsorship of the recent Watershed Congress in Washington at whose opening session our president presided.

Our research chief has been appointed to the editorial board of the "Journal of Soil and Water Conservation."

Our president and executive vice-president will participate in the Wenner-Gren Foundation's forthcoming conference at Princeton University on "What Man is Doing to the Face of the Earth."

The British Political and Economic Planning Committee asked our president, jointly with Professor Kingsley Davis of Columbia University, for a paper on the subject of the presumed ability of the United States to feed underdeveloped nations, and to receive larger numbers of emigrants from overpopulated countries. This will be published in London in February, 1955.

In the field of population problems, staff members are helping to prepare agendas for forthcoming Population Council Conferences.

Our president has been elected to the Board of Directors of the Metropolitan Educational Television Association. We are assisting in preparing twenty-six educational television shows based to a large extent on the Foundation's films.

Following the publication of the study of Pennsylvania Conservation Law and Administration, prepared by Professor William Schulz of the Pittsburgh University School of Law under our sponsorship, the Governor of Pennsylvania appointed Professor Schulz to assist in reorganization of that State's resource agencies.

In 1954 our staff took part in meetings and conventions held under the auspices of the organizations listed below.

American Chemical Society
American Water Works Association
Conservation Education Association
Institute of Biology, London
International Union for the Protection of Nature
National Association of Manufacturers
National Association of Soil Conservation Districts
National Geographic Society
Natural Resources Council of America
Soil Conservation Society of America
United Nations, World Population Conference, Rome
U.S. Department of the Interior, Advisory Committee
on Conservation
U.S. Forest Service
University of Michigan, School of Natural Resources

University of the State of New York, Board of Regents
Wildlife Management Institute
Yale University, Conservation Program

Also the following conferences, sponsored by several organizations:

Fifth Midwestern Conservation Education Conference,
Roscommon, Michigan
Midwestern States Flood Control Conference,
Lansing, Michigan
Third Conservation Conference for Representatives of
Business, Industry and Finance, Gaylord, Michigan

Additionally, we list the more important committees on which various members of our staff have served:

American Water Works Association
Industrial Water Use Committee
Boy Scouts of America
Conservation Committee and Committee on Activities
and Special Events
Garden Club of America
Advisor on Conservation Committee
International Union for the Protection of Nature
Observer at 9th General Assembly of U.N.
Metropolitan Educational Television Association
Board of Trustees
National Association of Manufacturers
Committee on Conservation of Renewable Natural
Resources
National Parks Association
Board of Trustees
Natural Resources Council of America
Chairman
Population Reference Bureau, Inc.
Sponsor
Soil Conservation Society of America
Business and Organization Relations Committee
Editorial Board
Technical Standards Committee
U.S. Department of the Interior
Advisory Committee on Conservation

JACKSON HOLE BIOLOGICAL RESEARCH STATION
of the
NEW YORK ZOOLOGICAL SOCIETY
and the
UNIVERSITY OF WYOMING

L. Floyd Clarke, Director

THE RESEARCH STATION operated to capacity during the summer of 1954. Research activities and other Station projects were of such a nature as to reflect credit upon the sponsoring institutions, the New York Zoological Society and the University of Wyoming.

RESEARCH--Grants totaling \$2,390 from the New York Zoological Society were of great assistance in carrying out the following research projects:

Margaret Altmann - Project 71: Patterns of herd structure in free-ranging Elk of Wyoming.

Alan Beetle - Project 64: Sagebrush-grass competition.

Dorothy Beetle - Project 72: Land and freshwater molluscs of Jackson Hole.

L. Floyd Clarke - Project 75: Effects of pollution on Swan Lake.

Reed W. Fautin - Project 76: Ecological succession in burned areas of the Wilderness Area.

Norman French - Project 66: The Black Rosy Finch.

Morton May - Project 65: Evaluation of Elk summer range, including study of range competition between cattle and Elk.

Dwight Miller - Project 74: Variation and distribution of certain *Drosophila* species.

James Opsahl - Project 73: Population densities of small mammals in different vegetation types, and collecting live mice for experimental studies.

Arnold Petersen - Project 70: Parental care in Cliff Swallows.

George W. Salt - Project 69: Avifaunal structure in the Teton Mountains.

Charles S. Thornton - Project 68: Influence of nerves on the regeneration and regression of limbs in Amphibia.

Harry V. Truman - Project 67: Taxonomic and ecological study and collection of alpine flora and pollen.

The personnel of the Grand Teton National Park Service

and the Forest Service cooperated effectively in carrying out the research projects. Official visits by Fairfield Osborn, president of the New York Zoological Society, and Dr. George Sprugel, field representative of the National Science Foundation, were greatly appreciated.

SEMINARS--A regular schedule of seminars was held at the Station, in which papers were presented either on research being done or on subject matter related to the projects. Through informal discussion the investigators profited by the suggestions and criticisms of others. Interested personnel of both the Forest Service and the Grand Teton National Park Service participated. Several additional informal sessions were held for the purpose of showing slides and general discussion. The congenial atmosphere at the Station was enhanced by picnics and other social gatherings.

LIBRARY--Books and journals were reorganized for the greater convenience of the investigators. Subscriptions were renewed through the University of Wyoming Library for all journals previously received, and new subscriptions and books were added. We expect a member of the University of Wyoming Library staff to catalog all books and periodicals and give them accession numbers. An attempt has been made to get in touch with all who have worked at the Station in the past and to obtain reprints of their papers based on Station research. A number of reprints have been received already.

PHYSICAL FACILITIES--The physical facilities of the Station were greatly improved during the summer of 1954, and plans were completed for additional improvement and expansion of the living accommodations.

PROSPECTS FOR 1955--The large number of early applications and letters of inquiry now in hand indicate that the Biological Research Station will be operated to full capacity during the summer of 1955.

A more detailed report on activities of the Jackson Hole Biological Research Station for 1954 is filed in mimeographed form with the New York Zoological Society and the Department of Zoology at the University of Wyoming.

SUMMARY OF EXPENDITURES, 1896 to 1954, New York Zoological Society and the City of New York, on Account of the Development and Maintenance of the Zoological Park and the Aquarium, Including the Purchase of Collections and Also for the Scientific and General Purposes of This Society.

Year	EXPENDED BY THE CITY OF NEW YORK			FROM CATE RECEIPTS		EXPENDED BY THE NEW YORK ZOOLOGICAL SOCIETY									
	Zoological Park Maintenance	Aquarium Maintenance	Bond Issues a/c Park & Aquarium	Construction and Repairs	Purchase of Animals	Zoological Park Development	Aquarium Improvements	Zoological Park Maintenance	Aquarium Maintenance	Purchase of Animals	Aquarium Specimens	Heads and Horns Collection	Pension Fund Contribution	Library and Paintings	Scientific and General Purposes
1896	.....	.....	.....	.....	.....	\$ 4,213.63	.....	.....	.....	.....	.....	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	6,424.61	.....	.....	.....	.....	.....	.....	.....	.....	.....
1898	.....	.....	.....	.....	.....	23,597.80	.....	\$ 1,292.16	.....	.....	.....	.....	.....	.....	\$ 2,903.74
1899	\$ 30,000.00	.....	.....	.....	.....	145,495.80	.....	7,038.61	.....	\$ 8,540.72	.....	.....	.....	.....	4,339.20
1900	40,000.00	.....	\$125,000.00	.....	\$ 2,470.88	34,626.24	.....	6,189.33	.....	3,784.32	.....	.....	.....	\$ 102.76	3,476.02
														88.13	5,601.78
1901	65,000.00	.....	300,000.00	.....	2,998.80	18,348.61	.....	3,714.37	.....	11,652.24	.....	.....	.....	462.20	7,597.16
1902	85,000.00	\$ 5,959.97	250,000.00	.....	4,256.50	20,983.07	.....	2,757.57	.....	20,983.07	.....	.....	.....	224.73	11,068.69
1903	104,965.00	46,453.68	280,000.00	.....	5,912.95	1,038.20	.....	.....	.....	20,361.62	.....	.....	.....	456.03	13,608.10
1904	104,965.00	46,439.72	315,000.00	.....	5,421.90	1,013.87	.....	1,894.37	.....	14,299.61	.....	.....	.....	887.16	15,072.84
1905	134,965.00	44,968.50	275,000.00	.....	6,849.00	144.00	.....	.....	.....	20,643.40	.....	.....	.....	418.10	18,773.90
1906	144,965.00	44,987.71	250,000.00	.....	8,132.35	778.48	.....	.....	.....	14,907.36	.....	.....	.....	319.16	17,961.67
1907	141,558.75	44,183.87	100,000.00	.....	8,248.65	370.72	.....	.....	.....	10,606.03	.....	\$ 892.71	.....	644.05	15,999.68
1908	154,627.00	44,157.27	65,000.00	.....	9,446.40	232.27	.....	.....	.....	4,231.61	.....	735.77	.....	1,313.87	14,693.92
1909	162,325.00	45,971.44	10,000.00	.....	9,992.75	2,860.92	.....	.....	.....	9,734.43	.....	7,340.82	.....	609.56	17,168.95
1910	167,632.00	45,974.86	89,500.00	.....	9,909.90	5,918.35	.....	.....	.....	4,339.25	\$ 973.90	2,036.39	.....	1,021.87	20,627.77
1911	174,632.00	47,560.21	155,000.00	.....	11,611.15	1,155.00	.....	.....	.....	6,659.89	1,191.80	1,615.38	.....	1,221.26	23,409.39
1912	182,365.00	46,597.08	.....	.....	11,838.40	40.00	.....	.....	.....	22,750.18	1,350.03	556.94	.....	1,031.55	32,109.01
1913	191,925.00	47,335.62	29,100.00	.....	12,404.25	218.45	.....	.....	.....	10,665.57	1,850.25	486.00	.....	732.97	32,543.88
1914	200,000.00	46,995.53	.....	\$ 9,237.81	3,831.15	2,175.13	.....	.....	.....	22,590.44	1,792.99	338.73	\$3,333.33	3,541.15	28,246.42
1915	200,000.00	46,991.66	21,425.00	.....	9,175.86	887.88	.....	.....	.....	13,629.41	1,466.64	1,024.91	8,000.00	4,181.24	31,398.08
1916	197,074.35	46,996.43	.....	.....	9,599.81	425.30	.....	.....	.....	13,511.12	2,193.57	1,031.47	8,000.00	1,555.12	38,339.99
1917	199,560.00	46,903.61	.....	.....	3,488.31	1,450.05	.....	11,537.79	.....	10,175.70	1,637.15	18.12	8,000.00	2,869.20	44,262.48
1918	207,586.00	48,630.71	.....	.....	2,642.70	48.12	.....	1,580.00	\$ 93.61	8,425.92	960.19	18.61	8,000.00	3,559.85	34,125.49
1919	190,000.00	45,000.00	5,000.00	.....	4,917.84	.....	\$ 3,450.00	19,924.00	407.07	13,345.59	1,028.05	88.27	8,000.00	1,442.07	45,599.71
1920	250,098.27	53,971.48	15,000.00	17,438.28	.....	5,007.00	4,093.03	5,141.92	.....	32,751.08	1,654.02	263.86	8,000.00	2,517.64	51,018.20
1921	276,951.01	65,203.12	88,000.00	25,463.77	.....	88,734.92	53,635.02	6,068.17	976.47	27,442.59	2,165.05	2,661.87	8,000.00	4,698.24	55,684.15
1922	264,618.05	63,341.26	25,000.00	17,060.00	.....	50,888.65	16,153.03	43,047.41	3,326.28	3,057.91	3,057.91	7,191.93	8,000.00	1,765.78	58,797.69
1923	262,724.50	57,166.63	.....	18,388.20	.....	5,000.00	.....	19,019.09	3,319.44	24,456.20	1,432.89	1,550.69	8,000.00	3,391.96	58,404.21
1924	262,471.01	57,319.20	7,970.00	16,806.00	.....	.....	28,233.45	28,956.34	8,097.14	11,560.62	2,013.88	942.34	8,000.00	1,938.77	76,559.41
1925	262,808.69	58,324.89	85,000.00	19,974.05	.....	.....	.....	38,793.01	4,380.45	20,843.01	2,609.55	667.78	8,000.00	1,174.24	242,753.89
1926	273,815.12	62,266.20	1,500.00	20,102.90	.....	.....	.....	45,467.10	7,261.21	23,460.04	2,847.35	306.32	8,000.00	562.40	87,915.27
1927	276,855.19	65,216.89	.....	18,960.48	.....	.....	1,395.00	61,968.22	11,656.97	27,545.92	2,861.55	135.00	8,000.00	2,477.37	82,807.54
1928	319,380.50	88,109.12	.....	18,106.25	.....	2,480.06	.....	52,676.35	10,776.84	21,001.88	2,912.97	107.89	8,000.00	1,168.15	88,794.37
1929	338,359.00	71,229.35	100,000.00	21,957.80	.....	13,095.54	984.85	59,673.38	13,670.81	23,783.69	3,572.14	669.48	8,000.00	4,029.63	122,774.78
1930	350,170.92	81,343.46	50,000.00	20,634.91	.....	2,500.89	375.00	65,600.39	16,966.30	17,492.92	1,355.56	639.04	10,000.00	2,726.37	134,278.88
1931	349,344.95	76,408.08	.....	14,890.58	.....	5,131.68	.....	65,601.03	19,541.40	24,439.56	3,650.58	1,707.40	10,000.00	6,713.26	128,871.12
1932	337,490.01	76,071.24	.....	16,710.25	.....	1,852.40	.....	61,127.48	19,155.01	20,039.28	1,934.84	335.00	10,000.00	3,607.97	97,303.32
1933	268,633.38	67,814.24	5,422.63	13,961.02	.....	.....	.....	62,996.66	18,120.73	7,644.14	2,199.91	118.65	10,000.00	3,384.38	86,757.06
1934	257,423.08	65,806.61	.....	11,025.88	.....	1,037.19	.....	66,502.59	18,229.23	9,267.86	1,641.06	162.86	10,000.00	606.53	81,711.26
1935	265,630.94	68,203.46	.....	11,596.51	.....	.....	.....	60,237.94	18,832.57	16,530.28	2,031.56	275.21	10,000.00	383.07	82,929.14
1936	265,057.37	68,760.95	.....	13,496.42	.....	100.00	.....	57,270.94	17,886.45	20,918.46	2,867.50	178.43	10,000.00	470.18	79,835.73
1937	267,192.29	73,807.74	.....	11,527.85	.....	.....	.....	56,262.45	16,408.55	22,417.08	2,799.17	24.79	19,047.09	1,415.39	92,609.40
1938	282,759.71	79,225.20	.....	10,235.70	.....	.....	.....	13,408.11	15,351.51	20,455.95	558.82	.....	20,455.95	431.41	93,543.59
1939	283,280.81	79,164.23	.....	11,019.23	.....	.....	.....	51,050.57	12,941.70	23,012.27	403.75	175.00	20,475.95	345.30	92,576.90
1940	282,761.15	78,905.12	.....	8,392.10	.....	102,343.87	.....	57,513.25	12,022.76	39,627.52	577.10	.....	20,669.17	533.85	98,501.09
1941	286,284.59	62,052.95	.....	15,947.33	.....	187,408.02	.....	84,254.19	9,466.70	57,236.77	574.40	.....	18,206.34	1,316.89	100,846.55
1942	258,656.76	50,931.00	.....	10,169.20	.....	43,088.43	.....	49,226.40	4,807.79	8,369.36	553.52	.....	10,762.57	401.65	144,765.21
1943	305,203.23	33,324.31	.....	11,904.80	.....	38,860.03	3,500.00	51,833.51	5,154.21	2,319.36	336.19	.....	9,832.98	574.01	73,192.91
1944	315,787.82	33,790.82	.....	17,316.09	.....	32,101.60	23,420.00	50,691.82	3,717.28	5,106.59	96.48	.....	10,234.06	405.52	88,594.55
1945	334,288.37	38,158.81	.....	20,745.35	.....	58,943.48	225.52	58,846.39	5,928.38	11,466.19	460.34	.....	12,681.89	1,001.92	112,541.29
1946	366,113.74	42,654.03	.....	24,688.34	.....	122,388.48	*34,997.55	62,439.25	6,742.70	43,037.09	172.30	.....	14,238.14	741.14	168,881.41
1947	440,147.60	40,285.04	.....	22,665.64	.....	101,392.80	*19,669.26	85,294.53	8,715.67	71,342.79	687.91	.....	15,751.26	690.03	348,442.82
1948	469,638.83	38,564.40	.....	30,690.08	.....	93,683.84	116.71	83,652.16	9,419.90	26,461.29	470.63	.....	16,708.48	1,004.40	346,222.76
1949	497,900.12	40,189.02	.....	25,400.02	.....	344,122.56	*4,203.50	82,044.22	11,170.76	50,408.80	1,370.90	.....	31,251.50	1,220.17	333,513.75
1950	506,035.90	40,188.48	.....	23,731.77	.....	62,598.22	.....	85,411.22	11,404.61	22,947.59	767.71	.....	35,049.90	970.52	298,458.78
1951	553,918.55	42,774.35	.....	28,913.22	.....	69,747.69	.....	94,063.94	12,966.97	17,934.34	613.19	.....	17,936.21	1,365.34	271,570.10
1952	579,931.76	45,809.54	.....	27,588.02	.....	40,542.32	.....	105,641.48	13,721.06	18,806.08	665.69	.....	18,938.55	1,618.36	335,393.47
1953	632,546.60	45,756.46	.....	27,066.78	.....	218,810.05	*9,123.67	97,757.81	14,329.34	28,470.18	468.74	.....	21,806.69	796.59	309,159.64
1954	639,084.84	48,606.34	.....	28,008.91	.....	76,808.53	*746,130.99	100,743.77	14,291.04	22,247.80	781.88	.....	22,999.30	1,382.30	297,882.62
Add Premium on Bonds, less Balances Reverting to the City															
			35,559.89												

Expended in Connection with Preparation and Publication of "A Monograph of the Pheasants" - Gift of Col. Anthony R. Kuser

194,100.00

Expended in Connection with Galapagos Expedition - Gift of Harrison Williams

98,670.00

Transfer by the Society of Endowment for Pension Fund-July 1, 1941

239,523.45

Totals	\$15,262,509.76	\$ 2,852,851.89	\$ 2,681,477.52	\$691,846.06	\$120,443.93	\$2,026,040.37	\$949,708.58	\$2,136,873.75	\$379,315.51	\$1,124,635.03	\$67,611.61	\$34,297.46	\$769,302.81	\$84,512.76	\$5,995,590.73
	\$20,796,839.17			\$812,289.99		\$13,567,888.61									

* Includes expenditures in respect of proposed new aquarium.

TREASURER'S REPORTS

For the Year Ended December 31, 1954

David H. McAlpin, Treasurer
30 East 40th Street
New York 16, N.Y.

NEW YORK ZOOLOGICAL SOCIETY

BALANCE SHEET

December 31, 1954

Assets

Cash in banks and on hand		\$ 205,813.16
Investments (approximate market value \$7,715,400) - (note 4)		5,650,282.68
Receivable from the City of New York:		
Appropriations for Zoological Park maintenance - calendar year 1954	\$ 687,691.18	
Less amount received	<u>606,518.25</u>	81,172.93
Other receivables		3,331.44
Park facilities' inventories		26,385.23
Unencumbered balances of deposits with City of New York for construction projects		17,505.81
Park facilities' assets, less depreciation (note 1):		
Improvements to land and buildings in Zoological Park	198,042.75	
Equipment and miscellaneous items	<u>83,554.94</u>	281,597.69
Prepaid expenses and deferred charges		8,187.27
National collection of heads and horns, art gallery, library and sundry items		1.00
Collection of living animals		1.00
Jackson Hole research station buildings		1.00
Simla tropical research station		<u>1.00</u>
		6,274,280.21
Aquarium Fund assets, per contra (note 4):		
Cash	42,340.88	
Investments (approximate market value \$454,500)	455,852.09	
Appropriation receivable from Society	300,000.00	
Deposit with City of New York	33,160.00	
Accrued interest receivable	<u>338.97</u>	
	831,691.94	
Less commitment to the City of New York for the construction cost of the first stage of the aquarium	<u>740,400.00</u>	<u>91,291.94</u>
		\$ <u>6,365,572.15</u>

BALANCE SHEET (Continued)

Liabilities

Accounts payable and accrued expenses	\$	54,308.87	
Appropriation payable to Aquarium Fund		300,000.00	
Fund reserves			
General Funds	\$	4,043,668.73	
Endowment Funds		1,209,261.19	
Special Purpose Funds		272,303.01	
Reserve for Educational and Other Purposes		32,893.11	
Park Facilities' Operating Fund		<u>361,845.30</u>	
			5,919,971.34
Aquarium Fund, per contra (note 4):			
Fund for construction of new penguin exhibit		2,500.00	
Reserve		<u>88,791.94</u>	
			<u>91,291.94</u>
	\$		<u>6,365,572.15</u>

Notes:

- (1) Park facilities' assets are subject to an agreement with the City of New York and the net income from park facilities' operations may be used only for the purchase of animals and the improvement of Zoological Park.
- (2) This balance sheet does not include the assets and liabilities of the Pension Fund.
- (3) Except for income from investments, which is accounted for in the year received, this balance sheet is prepared on an accrual basis.
- (4) The New York Zoological Society and the City of New York have entered into an agreement to construct an aquarium, as funds become available, at an estimated total cost of \$7,100,000.00 to be shared equally by both parties. Contracts have been awarded for the first stage of construction, which will cost approximately \$1,480,800.00. The Society has deposited with the City of New York cash of \$33,160.00 and U.S. Treasury bonds and notes of the par value of \$707,350.00 as a guarantee for its share, \$740,400.00, and U.S. Treasury bonds and notes of the par value of \$202,650.00 which will be returned by the City in 1955. The Society's share of preparatory costs, \$87,500.00, must be available on or about January 1, 1956.

FUND RESERVES

December 31, 1954

General:

General Working Fund	\$	31,632.56
Anna M. Harkness Fund		984,322.58
Sage Fund		611,001.57
Mary-Clark Thompson Fund		<u>2,416,712.02</u>
		4,043,668.73

Endowment:

George F. Baker Fund	\$	112,655.32
Mary Thurston Cockroft Fund		30,155.70
Robert Jaffray Fund		14,363.55
William Pyle Philips Fund		10,586.80
Rockefeller Fund		<u>1,041,499.82</u>
		1,209,261.19

Special Purpose:

Cadwalader Animal Fund		20,538.76
Conservation Account		22,817.05
Damon Fund		21,682.79
Grant Fund for the Protection of Wildlife		25,467.45
Jacob H. Schiff Fund		110,032.80
Stokes Bird Fund		5,169.25
Miscellaneous		<u>66,594.91</u>
		272,303.01

Reserve for Educational and Other Purposes

32,893.11

Park Facilities' Operating Fund

361,845.30

5,919,971.34

Aquarium Fund

91,291.94

\$ 6,011,263.28

Note: See notes 1, 3 and 4 to balance sheet.

PERMANENT WILD LIFE PROTECTION FUND

Cash

Investments (approximate market value \$164,400.00)

\$ 10,373.81

Principal Fund at December 31, 1954

127,975.77

\$ 138,349.65

SUMMARY OF CHANGES IN FUND RESERVES,
OTHER THAN PARK FACILITIES AND AQUARIUM FUNDS

Year ended December 31, 1954

General Funds

Balance at December 31, 1953		\$ 4,235,207.55
Receipts	\$ 167,984.97	
Transfer from Special Purpose Funds	<u>443.03</u>	<u>168,428.00</u>
		4,403,635.55
Expenditures	59,133.37	
Appropriation to Aquarium Fund	300,000.00	
Transfer to Special Purpose Funds	<u>833.45</u>	<u>359,966.82</u>
		4,403,668.73
Balance at December 31, 1954		\$ <u>4,403,668.73</u>

Endowment Funds

Balance at December 31, 1953		1,169,697.41
Receipts		<u>39,563.78</u>
Balance at December 31, 1954		\$ <u>1,209,261.19</u>

Special Purpose Funds

Balance at December 31, 1953		250,898.82
Receipts	116,697.94	
Transfers	<u>80,833.45</u>	<u>197,531.39</u>
		448,430.21
Expenditures	137,470.46	
Transfers	<u>38,656.74</u>	<u>176,127.20</u>
		272,303.01
Balance at December 31, 1954		\$ <u>272,303.01</u>

Reserve for Educational and Other Purposes

Balance at December 31, 1953		20,734.78
Appropriation from General Income Account		<u>30,000.00</u>
		50,734.78
Expenditures		<u>17,841.67</u>
Balance at December 31, 1954		\$ <u>32,893.11</u>

Note: See note 3 to balance sheet.

AQUARIUM FUND

Year ended December 31, 1954

Balance at December 31, 1953			\$ 232,270.30
Add:			
Gifts		\$ 281,200.53	
Appropriation from the general funds of the Society:			
Mary Clark Thompson Fund	\$ 180,720.00		
Anna M. Harkness Fund	73,590.00		
Sage Fund	<u>45,690.00</u>	300,000.00	
Transfer of unexpended balance of Laurance S. Rockefeller Fund		10,815.57	
Transfer of unexpended balance of Aquarium Fund Campaign Expense Account		12,398.14	
Income from investments	<u>1,179.11</u>	<u>605,593.35</u>	
			837,863.65
Deduct:			
Architects' fees	4,000.00		
Legal fees	500.00		
Cost of soil test borings	1,209.00		
Net loss on sales of securities	440.72		
Miscellaneous expense	<u>21.99</u>	<u>6,171.71</u>	
			831,691.94
Deduct commitment to the City of New York for the construction cost of the first stage of the aquarium			<u>740,400.00</u>
Balance at December 31, 1954			<u>\$ 91,291.94</u>

Note: See notes 3 and 4 to balance sheet.

GENERAL WORKING FUND

Year ended December 31, 1954

Balance at December 31, 1953		\$ 15,190.92
Add:		
Gifts	\$ 14,786.39	
Life memberships	1,685.00	
Conservation film royalties	8,195.31	
Pro-rata share of net profit on sales and redemption of investments	512.75	
Transfers from other general funds:		
Mary Clark Thompson Fund	\$ 30,120.00	
Anna M. Harkness Fund	12,265.00	
Sage Fund	<u>7,615.00</u>	50,000.00
Return of unexpended balance of appropriation for the Conservation Film program		443.03
Balance from general income account		<u>785.98</u>
		<u>76,408.46</u>
		91,599.38
Deduct payments:		
Remodeling reptile house	31,499.12	
Fund raising and membership promotion expenses	9,078.35	
Operating costs of Department of Tropical Research at Simla, Trinidad, B.W.I. for the year ended April 30, 1955	8,000.00	
Woods Hole Marine Biological Laboratory	4,000.00	
Production of publications on the care and exhibition of wild animals in captivity	3,500.00	
Operating expenses and research at Jackson Hole Research Station	3,283.45	
Publications	<u>605.90</u>	
		<u>59,966.82</u>
Balance at December 31, 1954		\$ <u>31,632.56</u>

Note: See note 3 to balance sheet.

GENERAL INCOME ACCOUNT

Year ended December 31, 1954

Income:

Income from investments	\$ 303,823.63
Annual dues	45,305.00
Sales of publications	4,131.97
Miscellaneous income	<u>8,693.67</u>
Total income	<u>\$ 361,954.27</u>

Expenses:

Actuarial fee	1,854.00
Annual report	3,278.97
Aquarium research	4,442.75
Audit fee	2,200.00
Conservation	25,000.00
Custodian fees	2,849.50
Educational activities	12,080.49
Employee welfare	3,355.51
Executive office	21,331.47
Group life insurance	5,104.83
Insurance	9,227.17
Legal fees	2,691.04
Library	1,382.30
Members - meetings and services	14,959.75
Membership promotion and fund raising	10,000.00

Pensions:

Fund contribution - 150% of employee contributions	\$ 22,999.30
Auxiliary payments	<u>6,424.44</u> 29,423.74

Photography - salaries and supplies	8,908.36
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Publication expenses:

Salaries and other expenses	18,158.14
"Animal Kingdom"	6,261.27
"Zoologica"	<u>13,463.65</u> 37,883.06

Reception expense	2,031.20
Social security taxes	1,187.54
Traveling expense	1,930.56
Tropical research	13,787.70
Miscellaneous expense	<u>1,223.54</u>
	216,133.48

Appropriation for reserve for educational and other purposes	30,000.00
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Park maintenance expenditures for the year 1954	802,725.99
Less amount provided by New York City	<u>687,691.18</u>
Amount expended by New York Zoological Society	115,034.81

Balance carried to General Working Fund	<u>785.98</u>
	<u>\$ 361,954.27</u>

Note: See note 3 to balance sheet.

PARK FACILITIES

Statement of Income and Expense and Operating Fund

Year ended December 31, 1954

Balance of Park Facilities' Operating Fund at December 31, 1953			\$ 313,913.46
Add:			
Receipts from sales at restaurants, stands, etc., and from services		\$ 985,070.39	
Less:			
Cost of merchandise sold	\$ 301,631.47		
Salaries and commissions	396,951.47		
Operating and maintenance supplies	101,632.04		
Depreciation	23,068.47		
Comprehensive public liability insurance	20,213.61		
Other operating and general expenses	<u>28,641.49</u>	<u>872,138.55</u>	
Net income from sales at restaurants, stands, etc. and from services (see note)			<u>112,931.84</u> 426,845.30
Deduct:			
Appropriations for park improvements	45,000.00		
Appropriations for the purchase of animals	<u>20,000.00</u>		
			<u>65,000.00</u>
Balance of Park Facilities' Operating Fund at December 31, 1954			\$ <u>361,845.30</u>

Note: See note 1 to balance sheet.

GIFTS, GRANTS AND LEGACY RECEIVED

Year ended December 31, 1954

General Fund:

George F. Baker, Jr. trust	\$ 704.50
Mrs. E. Gerry Chadwick	300.00
Childs Frick	6,600.00
Dr. Henry Clay Frick II	2,545.31
John H. Phipps	2,136.58
Rockefeller Brothers Fund	<u>2,500.00</u>
	14,786.39

Robert Jaffray Fund:

Final distribution of legacy	200.00
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American Committee for International Wild Life Protection:

Childs Frick	3,300.00
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Animal Fund:

Dr. Oshin Agathon	150.00
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Bermuda Biological Station for Research:

Childs Frick	1,650.00
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Bermuda Aquarium and Museum:

Childs Frick	1,650.00
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Blickman Film Fund:

Saul Blickman	7,000.00
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Cancer Research:

National Cancer Institute	25,800.00
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Conservation Account for National Audobon Society:

Childs Frick	2,478.00
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Conservation Foundation:

Childs Frick	13,200.00
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De Forest Grant Scientific Research Fund:

De Forest Grant	1,205.00
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Special Fund for Construction of Animal Nursery:

Polly and Gilbert Kahn Foundation, Inc.	<u>5,000.00</u>
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Carried Forward	\$ <u>76,419.39</u>
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GIFTS, GRANTS AND LEGACY RECEIVED (Continued)

Brought Forward

\$ 76,419.39

Special Projects:

Anonymous	\$ 250.00
The Roger Benjamin Fund, Inc.	50.00
Heyward Cutting	100.00
Mrs. T. J. Draper	25.00
Mrs. John L. Given	25.00
Mrs. Ruth Hill Heidsieck	114.00
Carl T. Keller	25.00
Dr. Shepard Krech	25.00
The Lyric Foundation - In memory of	
Mrs. Virginia Kent Cummins	25.00
Hubert E. & Anne E. Rogers Foundation, Inc.	100.00
Mrs. Axel Rosin	100.00
The Scherman Foundation, Inc.	250.00
Joseph A. Thomas	25.00
Time, Incorporated	250.00
Samuel Thorne	25.00
Mrs. Harrison Williams	300.00
Ernest H. Wyckoff	50.00
Others (23)	208.00
For Pacific Science Board:	
De Forest Grant	500.00

For Department of Tropical Research:

Anonymous	\$ 50.00		
Dr. William Beebe	354.00		
C. R. Vose	<u>11,868.87</u>	<u>12,272.87</u>	<u>14,719.87</u>

Aquarium Fund:

Anonymous	2,000.00		
The George F. Baker Trust	25,000.00		
Joseph Bonsignore	100.00		
Brooklyn Borough Gas Company	2,500.00		
Albert E. Buschman	250.00		
Children's Amusement Corporation	200.00		
Percy Chubb II	500.00		
The Corporation Trust Company	1,000.00		
C. Suydam Cutting	2,542.57		
Cyclone-Seacoast Holding Corporation	500.00		
Dr. Richard B. Dominick	100.00		
John Elliott	100.00		
Childs Frick	16,500.00		
Dr. Henry Clay Frick II	<u>2,545.31</u>		
Carried forward	\$ <u>53,837.88</u>	<u>91,139.26</u>	

GIFTS, GRANTS AND LEGACY RECEIVED (Continued)

Brought forward

\$ 91,139.26

Aquarium Fund, continued:

Brought forward

\$ 53,837.88

De Forest Grant	1,205.00
W.E.S. Griswold, Sr.	200.00
James Foundation of New York, Inc.	75,000.00
Mr. & Mrs. Warren Kinney	1,500.00
Estate of Theodore W. Kramer	750.00
Mr. & Mrs. David H. McAlpin	5,000.00
Nathan's Famous, Inc.	1,000.00
Anne Phipps	500.00
John H. Phipps	2,136.58
David Rockefeller	25,018.17
Laurance S. Rockefeller	64,262.90
Rockefeller Brothers Fund, Inc.	25,000.00
The Schiff Foundation	5,000.00
Thomas H. Tesauro Lumber and Coal Company	500.00
The Thorne Foundation	5,000.00
Tilyou Realty Company	1,750.00
George C. Tilyou and George C. McCullough	500.00
Edwin S. Webster Foundation	10,000.00
West Tenth Street Realty Corporation	500.00
Others (5)	40.00
	<u>278,700.53</u>

For Construction of New Penguin Exhibit:

Abraham & Straus

2,500.00

281,200.53

\$ 372,339.79

THE PENSION FUND
(Founded by Andrew Carnegie)

Statement of Cash Transactions

Year ended December 31, 1954

Balance at December 31, 1953:

Investments (approximate market value \$1,154,900.00)	\$ 1,018,317.88
Accrued interest purchased	13.33
Uninvested balance of cash	<u>6,488.24</u>
	1,024,819.45

Receipts:

Income from investments:

Interest	\$ 14,576.21
Dividends	<u>32,601.50</u>
	47,177.71

Contributions by employees 18,648.10

Contributions by New York Zoological
Society (150% of contributions by
employees):

Society	\$ 23,075.53	
Facilities	<u>4,896.71</u>	27,972.24

Special contributions	<u>8.53</u>	<u>93,806.58</u>
		1,118,626.03

Expenditures:

Refunds on account of resignations	2,592.25
Refunds to heirs of deceased employees	502.37
Other refunds	127.28
Pension disbursements	<u>28,247.02</u>
	<u>31,468.92</u>
	1,087,157.11

Net loss on sale of securities	<u>2,067.02</u>
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Balance at December 31, 1954:

Investments (approximate market value \$1,385,500.00)	1,073,763.60
Accrued interest purchased	41.35
Uninvested balance of cash	<u>11,285.14</u>
	\$ <u>1,085,090.09</u>

PEAT, MARWICK, MITCHELL & CO.

CERTIFIED PUBLIC ACCOUNTANTS

SEVENTY PINE STREET

NEW YORK 5, N.Y.

NEW YORK
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LOUISVILLE
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MEXICO
SOUTH AMERICA

ACCOUNTANTS' REPORT

The Board of Trustees
New York Zoological Society
New York, N. Y.

We have examined the balance sheet of the New York Zoological Society as of December 31, 1954 and statements of the transactions of the various funds of the Society and of The Pension Fund for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

We made a test-check of the subscriptions, donations and dues reported as received and of the income from investments, and found such items to be properly recorded. The securities recorded in the various funds were in agreement with schedules and other supplementary data prepared by the custodians of such securities held for the account of the Society. Bank balances were confirmed directly to us by the depositories and were reconciled with the respective cash balances recorded in the accounts. We examined approved vouchers and paid checks for a number of representative expenditures.

Park facilities' assets are carried in the accounts at net depreciated book amounts as of December 31, 1940 plus subsequent additions at cost, less retirements. Provision for depreciation from January 1, 1941 to December 31, 1954 has been computed on the resulting book balances.

In our opinion, subject to the comments contained in the previous paragraph, the accompanying balance sheet and statements of transactions of the various funds of the Society present fairly the financial position of the Society at December 31, 1954 on the basis stated therein, and the changes in the funds of the Society for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

New York, N. Y.
February 23, 1955

Peat, Marwick, Mitchell & Co.

REPORT OF THE AUDITING COMMITTEE
OF THE
NEW YORK ZOOLOGICAL SOCIETY

To the President and Board of Trustees
of the New York Zoological Society

Dear Sirs:

We have examined the reports of Peat, Marwick, Mitchell & Co., Certified Public Accountants, on their examination of the balance sheet of the New York Zoological Society as of December 31, 1954, and statements of the transactions of the various funds of the Society and of The Pension Fund for the year then ended. We have noted that their examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as they considered necessary in the circumstances. The balance sheet and statements of transactions of the various funds of the Society present fairly, in our opinion, the financial position of the Society as of December 31, 1954.

We accordingly submit Messrs. Peat, Marwick, Mitchell & Company's reports to you as a satisfactory examination of the balance sheet and statements of the transactions of the various funds of the Society and of The Pension Fund.

Respectfully submitted,

George F. Baker, Chairman
William DeForest Manice
J. Watson Webb

March 30, 1955

NEW YORK ZOOLOGICAL SOCIETY

INCORPORATION of the New York Zoological Society by the State of New York was accomplished under Chapter 435 of the Laws of 1895 and the basic purposes of the Society were embodied in Section 2:

Said corporation shall have power to establish, maintain and control zoological parks, gardens, or other collections for the promotion of zoology and kindred subjects, and for the instruction and recreation of the people. Said corporation may collect, hold and expend funds for zoological research and publication, for the protection of wild animal life, and for kindred purposes, and may promote, form, and co-operate with other associations with similar purposes, and may purchase, sell, or exchange animals, plants, and specimens appropriate to the objects for which it was created.

Subsequently, at a special meeting of the Commissioners of the Sinking Fund, City of New York, held on March 24, 1897, a resolution was passed allotting South Bronx Park for the use of the New York Zoological Society and establishing the terms of a management agreement under which the Society has operated since that date, with only minor modifications.

The resolution of March 24, 1897, and the supplemental agreement of January 24, 1942, provided that the Society should furnish the original equipment of buildings and animals, that it should raise \$250,000 by subscription within three years of the date of starting work on the improvement of the grounds, that the Society should have the right to establish an endowment fund to be used solely for the general uses and purposes of the Society unless otherwise specified by the donors, that the City of New York should provide funds for the maintenance and care of the Zoological Park and for the maintenance of the animal collections, that the Zoological Park should be open to the public free at least four days a week, that the Society may expend the net proceeds of facilities only for the purchase of animals and the improvement of the Zoological Park and that the Society should have the right to make and control all appointments of employees and to fix salaries and make promotions.

MEMBERSHIP IN THE
NEW YORK ZOOLOGICAL SOCIETY

THE NEW YORK ZOOLOGICAL SOCIETY was founded in 1895 for the "instruction and recreation of the people" through the establishment of a Zoological Park, for the promotion of zoology through exhibition of collections, publication, research and exploration, and for the conservation of animal life of the world. Since 1899 the Zoological Society has directed the New York Zoological Park and in 1902 it was entrusted with the management of the New York Aquarium.

MEMBERSHIP is actively invited of all persons who are interested in the objects of the Society and desire to contribute toward its support.

ANNUAL MEMBERSHIP is \$15. Contributing Membership is \$25. These Memberships entitle the holders to Member's cards and 10 guest tickets of admission to the Zoological Park on pay days; a copy of the Annual Report; a subscription to Animal Kingdom, the bi-monthly publication of the Society; privileges of the Library and Members' Lounge in the Administration Building and to attend all open meetings of the Society. Tickets to all sections of the Zoological Park for which an admission charge is made are available, free, to Members upon application at the Administration Building in person. Members will be taken on "behind the scenes" tours of the Zoological Park and Aquarium, without charge, on application, and are entitled to 20% discount on all publications of the Society. We are advised that Contributing Membership fees are deductible from income tax within the legal limits.

LIFE MEMBERSHIP is \$300. See By-laws for conversion of Annual and Contributing to Life Membership. Other classes of membership are: Patron, \$1,000; Associate Founder, \$2,500; Founder, \$5,000; Founder in Perpetuity, \$10,000; Benefactor, \$25,000.

APPLICATIONS for membership may be submitted to any officer of the Society or to the Society's general office at 30 East 40th Street, New York 16, N. Y.

FORM OF BEQUEST

I do hereby give and bequeath to the "New York Zoological Society," of the City of New York.
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NEW YORK ZOOLOGICAL SOCIETY

Organized 1895

Presidents

I. Andrew H. Green	1895 to 1897
II. Levi P. Morton	1897 to 1909
III. Henry Fairfield Osborn	1909 to 1925
IV. Madison Grant	1925 to 1937
V. W. Redmond Cross	1937 to 1940
VI. Fairfield Osborn	1940

First Vice-Presidents

I. J. Hampton Robb	1895 to 1897
II. Henry Fairfield Osborn	1897 to 1909
III. Samuel Thorne	1909 to 1916
IV. Madison Grant	1916 to 1925
V. Frank K. Sturgis	1925 to 1932
VI. W. Redmond Cross	1932 to 1937
VII. Kermit Roosevelt	1937 to 1939
VIII. Alfred Ely	1939

Second Vice-Presidents

I. Charles E. Whitehead	1895 to 1902
II. John L. Cadwalader	1902 to 1915
III. Madison Grant	1915 to 1916
IV. Frank K. Sturgis	1916 to 1925
V. Henry D. Whiton	1925 to 1930
VI. Kermit Roosevelt	1930 to 1937
VII. Alfred Ely	1937 to 1939
VIII. Laurance S. Rockefeller	1939

Treasurers

I. L. V. F. Randolph	1895 to 1901
II. Charles T. Barney	1901 to 1903
III. Percy Rivington Pyne	1903 to 1922
IV. Cornelius R. Agnew	1922 to 1953
V. David H. McAlpin	1953

Secretaries

I. Madison Grant	1895 to 1925
II. William White Niles	1925 to 1935
III. Fairfield Osborn	1935 to 1940
IV. Harold J. O'Connell	1941

Chairmen, Executive Committee

I. Charles E. Whitehead	1895 to 1896
II. Henry Fairfield Osborn	1896 to 1903
III. Charles T. Barney	1903 to 1907
IV. Henry Fairfield Osborn	1907 to 1909
V. Madison Grant	1909 to 1937
VI. W. Redmond Cross	1937 to 1940
VII. Laurance S. Rockefeller	1940 to 1943
VIII. Fairfield Osborn	1943 to 1945
IX. Laurance S. Rockefeller	1945

Directors

I. William T. Hornaday Zoological Park	1896 to 1926
II. Charles H. Townsend New York Aquarium	1902 to 1937
III. W. Reid Blair Zoological Park	1926 to 1940
IV. Allyn R. Jennings	1940 to 1941
V. Charles M. Breder, Jr. New York Aquarium	1937 to 1943
VI. John Tee-Van Zoological Park	1952

BOARD OF TRUSTEES

City of New York
Ex-officio

Hon. Robert F. Wagner, The Mayor
Hon. Robert Moses, Commissioner of Parks

Class of 1955

George F. Baker, Jr.
F. Trubee Davison
John Elliott
Robert I. Gannon, S.J.
Peter Grimm
Fairfield Osborn

Eben Pyne
Laurance S. Rockefeller
Archibald B. Roosevelt
John M. Schiff
Edwin S. Webster

Class of 1956

Archibald S. Alexander
Harry Payne Bingham
A. Raymond Dochez
Robert G. Goelet
DeForest Grant
Eugene Holman

Warren Kinney
William DeForest Manice
Harold J. O'Connell
Landon K. Thorne
J. Watson Webb

Class of 1957

Robert E. Blum
Percy Chubb, 2nd
C. Suydam Cutting
Alfred Ely
Marshall Field

Childs Frick
Henry Clay Frick
Archer M. Huntington
David H. McAlpin
John H. Phipps

OFFICERS OF THE SOCIETY

Fairfield Osborn, President

Alfred Ely,
Laurance S. Rockefeller,
Donald T. Carlisle,
Vice-Presidents

Harold J. O'Connell, Secretary

David H. McAlpin, Treasurer

Percy Chubb, 2nd, Assistant Treasurer

General Office:
30 East 40th Street
New York 16, N.Y.

EXECUTIVE COMMITTEE

Laurance S. Rockefeller, Chairman	
David H. McAlpin, ex-officio	Robert Moses, ex-officio
John Elliott	Harold J. O'Connell, ex-officio
Alfred Ely	Fairfield Osborn, ex-officio
Robert G. Goelet	
DeForest Grant	
Warren Kinney	

PENSION BOARD

Fairfield Osborn, Chairman	
Fred Archer	Warren Kinney
Christopher W. Coates	David H. McAlpin
Percy Chubb, 2nd	Eben Pyne
Alfred Ely	Herbert F. Schiemann
Leonard J. Goss	John Tee-Van

COMMITTEES OF THE SOCIETY

NOMINATING COMMITTEE FOR BOARD OF TRUSTEES

E. Roland Harriman, Chairman
William M. Chadbourne Samuel Thorne

FINANCE COMMITTEE

David H. McAlpin, ex-officio, Chairman
John Elliott Fairfield Osborn,
DeForest Grant John M. Schiff ex-officio

AUDITING COMMITTEE

George F. Baker, Jr., Chairman
C. Suydam Cutting Fairfield Osborn,
William DeForest Manice ex-officio
Harold J. O'Connell, J. Watson Webb
ex-officio

EDITORIAL COMMITTEE

Fairfield Osborn, Chairman
James W. Atz Lee S. Crandall
William Beebe Leonard J. Goss
William Bridges James A. Oliver
Christopher W. Coates John Tee-Van

SCIENTIFIC ADVISORY COUNCIL

A. Raymond Dochez Caryl P. Haskins
Alfred Emerson K. S. Lashley
W. A. Hagan John S. Nicholas

HEADS AND HORNS COMMITTEE

Alfred Ely, Chairman
Laurance S. Rockefeller F. Carrington Weems
Samuel B. Webb

STAFF

John Tee-Van, Director
Leonard J. Goss, Assistant Director

ZOOLOGICAL PARK

Robert M. McClung, Curator, Mammals & Birds
Grace Davall, Assistant Curator, Mammals & Birds
James A. Oliver, Curator, Reptiles
Leonard J. Goss, Veterinarian
Charles P. Gandal, Assistant Veterinarian
Gordon Cuyler, Administrative Assistant
Herbert J. Knobloch, Assistant Curator, Education
John V. Quaranta, Research Associate, Animal Behavior
Quentin Melling Schubert,
Superintendent, Construction & Maintenance
Edward Kearney, Manager, Facilities Department

Lee S. Crandall, General Curator Emeritus
William Beebe, Honorary Curator, Birds

AQUARIUM

Christopher W. Coates, Curator & Aquarist
James W. Atz, Assistant Curator
Ross F. Nigrelli, Pathologist
Myron Gordon, Geneticist
C. M. Breder, Jr., Research Associate in Ichthyology
Harry A. Charipper, Research Associate in Histology
Homer W. Smith, Research Associate in Physiology

DEPARTMENT OF TROPICAL RESEARCH

William Beebe, Director Emeritus
Jocelyn Crane, Assistant Director
Henry Fleming, Entomologist
Rosemary Kenedy, Research Assistant
William K. Gregory, Associate
John Tee-Van, Associate

GENERAL

Herbert F. Schiemann, Comptroller
William Bridges, Editor & Curator, Publications
Dorothy Reville, Editorial Assistant
Sam Dunton, Photographer
Henry M. Lester, Photographic Consultant

C. R. Carpenter, Co-ordinator
Animal Behavior Research Programs

AFFILIATES

CONSERVATION FOUNDATION

President
Fairfield Osborn

Executive Vice-President
Samuel H. Ordway, Jr.

Vice-Presidents

George E. Brewer, Jr.
Donald T. Carlisle

Alfred Ely
Robert G. Snider

Staff

Stephen W. Bergen
John C. Gibbs

Hugh J. Ross
Peter M. Stern

JACKSON HOLE BIOLOGICAL RESEARCH STATION OF THE NEW YORK ZOOLOGICAL SOCIETY AND THE UNIVERSITY OF WYOMING

Curator
L. Floyd Clarke

BY-LAWS OF THE NEW YORK ZOOLOGICAL SOCIETY

ARTICLE I • MEMBERS

SECTION 1. The present members and such others as hereafter shall become members in accordance with these by-laws shall be the members of this Society.

SEC. 2. Annual and contributing members shall be elected by the Board or Executive Committee and, upon election, shall qualify for such membership by payment of dues for the first year commencing on the date of their election.

SEC. 3. Annual dues of annual members shall be \$15, and of contributing members \$25. Any person who shall fail to qualify within three months after his election shall be deemed to have declined his election.

SEC. 4. Any member who shall fail to pay his annual dues within three months after notice that they have become due and demand therefor, shall cease to be a member of the Society. He may, however, be reinstated by the Board or Executive Committee for good cause shown.

SEC. 5. Any person who shall have donated to the Society, in the aggregate, cash or the equivalent in value of any of the following amounts shall be eligible for election, by the Board or Executive Committee, to the class of membership appearing opposite such amount:

\$ 300.00	Life Membership	\$ 5,000.00	Founder
\$1,000.00	Patron	\$10,000.00	Founder in Perpetuity
\$2,500.00	Associate Founder	\$25,000.00	Benefactor

An annual member who has paid dues for five consecutive years and a contributing member who has paid dues for three consecutive years, may thereafter, at any time, upon payment of the difference between the aggregate dues already paid and \$300, but in no case less than \$100, be elected a Life Member. Upon the death of a trustee, his widow shall be eligible for election, by the Board or Executive Committee, to Life Membership.

SEC. 6. The Board or Executive Committee may elect to membership in the following classes persons who, in their judgment, have achieved the qualifications hereinafter specified:

Fellows:—Persons of marked scientific achievement.

Honorary Members:—Persons who have rendered distinguished services in the science of zoology or natural history.

Corresponding Members:—Persons who have rendered marked services to the Society through correspondence.

SEC. 7. All but annual and contributing members shall be exempt from payment of annual dues.

SEC. 8. Benefactors and Founders in Perpetuity shall have the power to designate their respective successors, who shall thereupon be entitled to all the rights and privileges of their predecessors, including the right in turn to designate their successors. Such designation shall be in writing indorsed or attached to the certificate of membership or by last will and testament.

ARTICLE II • PRIVILEGES OF MEMBERS

SECTION 1. Each annual and contributing member shall be entitled to a member's ticket, ten tickets of admission to the Zoological Park and Aquarium on pay days, a copy of the annual report, a copy of the official periodical publication of the Society, and shall be entitled also to the privileges of the Administration Building at the Zoological Park.

SEC. 2. Life Members shall be entitled to all the privileges of annual members and also to ten additional tickets of admission to the Zoological Park and Aquarium on pay days.

SEC. 3. Benefactors, Founders in Perpetuity, Founders, Associate Founders and Patrons shall be entitled to all the privileges of Life Members and also to receive the Society's scientific publication "Zoologica."

SEC. 4. A member's ticket, issued annually, shall admit the member and his immediate family to the Zoological Park and Aquarium on pay days and to lectures and special exhibitions. It may be used by the member's immediate family.

SEC. 5. Each member, other than a member elected pursuant to Article I, Section 6, shall be entitled to one vote at each meeting of the Society.

SEC. 6. Any member who shall fail to comply with the provisions of these by-laws may be suspended from the privileges of membership or dropped from the rolls of the Society, by a majority vote of those present at a duly constituted meeting of the Board or Executive Committee.

ARTICLE III • MEETINGS OF THE SOCIETY

SECTION 1. The Annual Meeting of the Society shall be held on the third Tuesday in April in each year, or on such day thereafter and at such time and place as may be designated by the Board or Executive Committee

SEC. 2. Special Meetings of the Society may be called upon order of the President or Chairman of the Executive Committee or on the written request of ten Trustees delivered to the Secretary.

SEC. 3. Notice of each annual and special meeting of the Society, stating the time, place and purpose thereof, shall be mailed, not less than ten nor more than forty days before such meeting, to each member at his address last recorded with the Secretary.

SEC. 4. At all meetings of the Society twenty members shall constitute a quorum.

ARTICLE IV • BOARD OF TRUSTEES

SECTION 1. The property, affairs and business of the Society shall be managed and controlled by a Board of Trustees consisting of thirty-six members divided into three equal classes, together with the Mayor and the Commissioner of Parks of the City of New York who shall be members *ex officio* of the Board. Each class of elected trustees shall hold office for three years and until its successors are elected. The term of office of one class shall expire each year and its successor shall be elected at the annual meeting of the Society.

SEC. 2. No person shall be eligible for election to the Board unless he shall be either a Benefactor, Founder in Perpetuity, Founder, Associate Founder, Patron or Life Member and, excepting to fill vacancies, unless his name shall have been posted as a candidate by the Nominating Committee or by not less than ten members in writing in a conspicuous place in the office of the Society not less than ten days before the annual meeting.

SEC. 3. Vacancies in the Board may be filled for the unexpired term by the Board or Executive Committee at any regular or special meeting, by ballot, by a majority vote of the members present; but no person shall be eligible for election to fill a vacancy unless he shall have been nominated at a meeting of the Board or Executive Committee held not less than four weeks prior thereto.

SEC. 4. The Board shall hold an annual meeting in December in each year, on a date and at a time and place designated by the Board or Executive Committee. Other meetings of the Board may be called upon order of the President or Chairman of the Executive Committee or at the written request of five Trustees delivered to the Secretary. Twelve Trustees shall constitute a quorum.

SEC. 5. Notice of each meeting of the Board shall be mailed to each Trustee at least seven days before the annual meeting and at least three days before any other meeting.

SEC. 6. A Trustee who shall fail to attend three consecutive meetings of the Board, without being excused by the Board, shall be deemed to have resigned as a Trustee.

SEC. 7. The Board at its annual meeting in each year shall appoint three standing committees — an Executive Committee, a Finance Committee and an Auditing Committee — each of which shall serve for one year, or until its successors are appointed. The Board or Executive Committee may appoint such other Committees and delegate to them such powers as they may deem advisable or necessary. The President shall designate the Chairman of each committee. Any vacancy in any committee including the Executive Committee, however occurring, shall be filled by the Board or Executive Committee. Except as to the Executive Committee, a majority of a committee shall constitute a quorum for the transaction of business, but all action shall be decided by a majority vote of the members of the committee.

ARTICLE V • OFFICERS

SECTION 1. The Board of Trustees at its Annual Meeting in each year shall elect a President, a First Vice President, a Second Vice President, a Treasurer and a Secretary from among the Trustees. The said officers shall hold office respectively for the ensuing year and until their successors are elected. Any vacancy for an unexpired term may be filled by the Board or Executive Committee.

SEC. 2. The President shall preside at all meetings of the Society and of the Board, exercise general supervision of the affairs of the Society, from time to time call attention of the Board to such subjects as in his opinion require consideration. Unless otherwise ordered by the Board or Executive Committee, he shall execute all contracts and instruments on behalf of the Society, and shall exercise the usual functions pertaining to his office. He shall be a member *ex officio* of all standing committees.

SEC. 3. The Vice Presidents, in order of seniority, in case of death, absence, resignation or disability of the President shall perform his duties and exercise his powers.

SEC. 4. The Treasurer shall supervise the collection, receipt and custody of the funds and securities of the Society subject to the order of the Board or Executive Committee and the deposit of all funds of the Society with banks or trust companies approved by the Board or Executive Committee. He shall see that all bills and appropriations are paid as ordered by the Board or Executive Committee and checks shall be signed by such officers and agents as the Board or Executive Committee shall determine. The Treasurer shall supervise the keeping of regular and correct accounts and shall submit reports to the Society at its Annual Meeting, to the Board at all Regular Meetings and to the Executive Committee at each meeting. He shall be a member *ex officio* of the Executive Committee and of the Finance Committee. The books of account of the Society shall be open at all times to the inspection of the Trustees and the Executive, Finance and Auditing Committees. The fiscal year of the Society shall be the calendar year.

SEC. 5. The Secretary, unless otherwise ordered by the Board or Executive Committee, shall cause notices to be issued of all meetings of the Society, the Board and the Executive Committee, attend all such meetings and keep the minutes thereof. He shall affix and attest the seal of the Society to all contracts and instruments executed on behalf of the Society unless otherwise ordered by the Board or Executive Committee. He shall conduct the correspondence of the Society, have custody of the seal, archives and books, other than books of account, and perform the usual duties pertaining to his office and such other duties as the Board or Executive Committee may direct. He shall be a member *ex officio* of the Executive Committee.

SEC. 6. The Board or the Executive Committee may appoint annually a Director of the New York Zoological Park. He shall devote his entire time to the affairs of the Society. Subject to the President, the Board and the Executive Committee, he shall be the executive officer of the Park; shall exercise general supervision of the Park and all activities there engaged in by the Society; shall be responsible generally for the performance by all employees at the Park of their respective duties and for the execution of all orders of the Board or Executive Committee and shall engage and discharge personnel, excepting officers, employed at the Park. He shall perform all such other duties in connection with the

business, scientific and literary administration of the Society as may be assigned to him by the Board, the Executive Committee and the President. The Director need not be a Trustee.

SEC. 7. The Board or the Executive Committee may appoint annually a Comptroller. The Comptroller shall devote his entire time to the affairs of the Society except as otherwise ordered by the Board or the Executive Committee. He shall act as chief fiscal officer of the Society under the Treasurer; he shall have custody of and preserve all records and documents relating to the property of the Society, keep proper books of account, see that audits thereof are currently and regularly made, and in conjunction with other officers and officials, initiate and enforce measures and procedures whereby the business of the Society shall be conducted with the maximum efficiency and economy. He shall perform all such other duties in connection with the business, scientific and literary administration of the Society as may be assigned to him by the Board, the Executive Committee, the President and the Treasurer. The Comptroller need not be a Trustee.

SEC. 8. The Board or Executive Committee may appoint one or more Assistant Treasurers, Assistant Secretaries and such other officers or officials as may be deemed necessary, none of whom need be a Trustee, to serve at the pleasure of the Board or Executive Committee, and may define their respective duties. A bank or trust company organized under the laws of the State of New York and having its principal place of business in New York City may be appointed Assistant Treasurer and banks or trust companies organized under the laws of the United States or of the State of New York and having their principal place of business in New York City may be made custodians of the securities and investments of the Society upon such terms as may be specified and with such powers as may be delegated to them by the Board or Executive Committee.

ARTICLE VI • COMMITTEES

SECTION 1. *Executive Committee*—This Committee shall consist of eight Trustees, and the President, Treasurer and Secretary as members *ex officio*.

In the interim between meetings of the Board, the Executive Committee shall manage and control the property, business and affairs of the Society and exercise all the powers of the Board to the extent not delegated to other Committees or contrary to law. It shall report regularly to the Board, and send copies of its minutes and of reports made to it to each member of the Board.

Regular meetings of the Executive Committee shall be held on the third Tuesday in each month, unless otherwise ordered by the Chairman, at such time and place as shall be fixed by the Chairman. Special meetings may be called upon order of the Chairman or at the written request of three members of the Committee delivered to the Secretary. Four members including the Chairman shall constitute a quorum, but all action shall be decided by a majority vote of the members present.

The Executive Committee shall appoint each year a Nominating Committee which shall hold office for one year and until its successors are appointed.

The Executive Committee shall fix the salaries of the officers and employees of the Society unless otherwise directed by this Committee or the Board.

SEC. 2. *Finance Committee*—This Committee shall consist of not less than three Trustees and the President and Treasurer as members *ex officio*.

Regular meetings of the Finance Committee shall be held quarterly unless otherwise ordered by the Chairman, at such time and place as shall be fixed by the Chairman. Special meetings may be called upon order of the Chairman on not less than three days' written or 24 hours' verbal notice.

The Finance Committee shall have power to sell securities and other investments belonging to the Society and to reinvest proceeds of sale and invest any other funds of the Society available for investment, in such securities or investments as it may deem wise. It shall report quarterly to the Executive Committee all purchases and sales of securities and investments made by it. It may submit to the Board or Executive Committee its recommendations with regard to sales or purchases of securities or other investments.

Notwithstanding the power hereby conferred, the Board or Executive Committee may, at any time, direct the sale of any securities and investments held by the Society, or direct the reinvestment of any proceeds of sale or investment of other funds of the Society available for investment in such securities or investments as it may specify.

Directions to any custodian or depositary for the purchase or sale of securities or other investments or other action in connection therewith shall be given by the officers, members of the Finance Committee or such agents as the Board or Executive Committee may from time to time determine.

SEC. 3. *Auditing Committee*—This Committee shall consist of three members, other than members elected pursuant to Article I, Section 6, and the President and the Secretary as members *ex officio*.

The Auditing Committee shall cause the accounts and funds of the Society to be audited and certified annually, or as often as it deems advisable, by a certified public accountant of its selection and shall report to the Board on its examination of the report of the certified public accountant.

SEC. 4. *Nominating Committee*—This Committee shall be composed of three members other than Trustees and members elected pursuant to Article I, Section 6. This Committee shall select twelve candidates, to succeed the outgoing class of Trustees, to be voted upon at the ensuing annual meeting. The names of such candidates shall be posted in a conspicuous place in the office of the Society at least ten days before the annual meeting.

ARTICLE VII • AMENDMENTS

SECTION 1. These By-Laws may be amended, either by change or repeal of any provision or the adoption of new provisions, at any meeting of the Board by majority vote of the Trustees present, provided such proposed amendment is set forth in full in the notice of such meeting.

